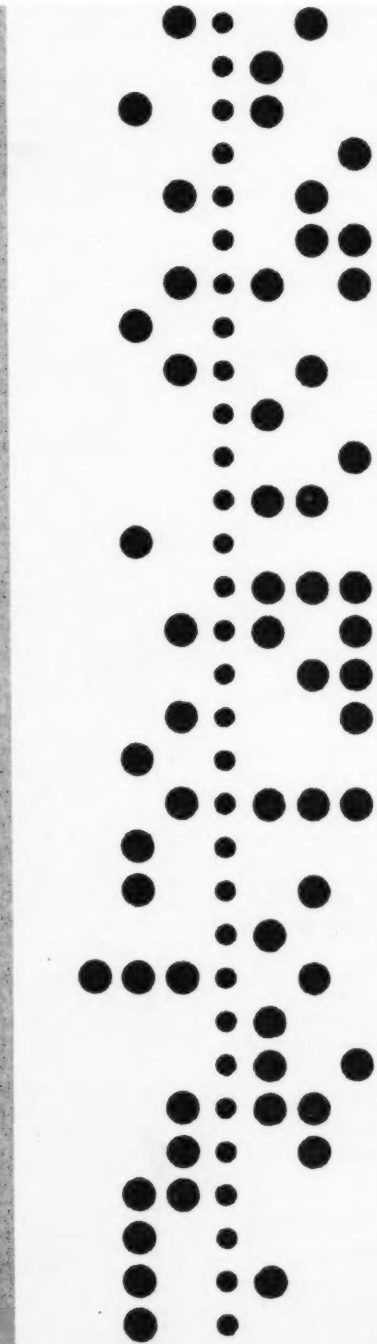
December 20, 1965

U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS



A Semi-monthly Abstract Journal for Science and Industry

CLEARINGHOUSE
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

December 20, 1965 / Volume 40, Number 24

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

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PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense and other Federal agencies. Included are reports from the Atomic Energy Commission and the National Aeronautics and Space Administration, which issue separate announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 22 major subject category headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in "Research Highlights."

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject category headings; the various indexes will aid in locating those reports. A single reference guide to new Government-sponsored technical literature, *Government-Wide Index to Federal Research and Development Reports*, is compiled monthly by the Clearinghouse from the combined indexes of this journal, *Nuclear Science Abstracts* (AEC), *Scientific and Technical Aerospace Reports* (NASA), and *Technical Abstract Bulletin* (DDC). This combined index is available from Superintendent of Documents, U.S. Government Printing Office, annual subscription $16, ($4.00 for foreign mailing) or $1.75 single copy.

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Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. They are abstracted in the following journals available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

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Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated. Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

NEW PATENT SUBSCRIPTION SERVICE

All new U. S. Patents announced in the Official Gazette will be available from the Clearinghouse on 16mm microfilm beginning in January 1966. The new service will be by subscription only. Individual patents will not be available on film.

The subscription price is $830 a year ($850 foreign; $920 foreign air mail). The estimated 67,000 patents announced annually will be distributed to subscribers in 100-foot reels of 16mm film -- three reels or 1,260 patents each week. These same patents ordered in hard copy form from the U. S. Patent Office would cost $33,500 annually. The new service also makes it possible for subscribers to save an estimated $2,000 a year in binding and storage costs. Patents issued in excess of 67,000 will be billed to subscribers at the rate of $5.25 per 100 foot reel (420 patents).

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USGRDR GOES TO AUTOMATIC PHOTOCOMPOSITION

Another phase of our continuing program to improve the appearance and utility of the USGRDR is underway. The white section (Technical Abstract Bulletin) is now prepared on computer-actuated photocomposition equipment. The blue section (Other Research Reports and Related Material) will be included shortly in this new system of photocomposition to produce a journal of uniform printing format.

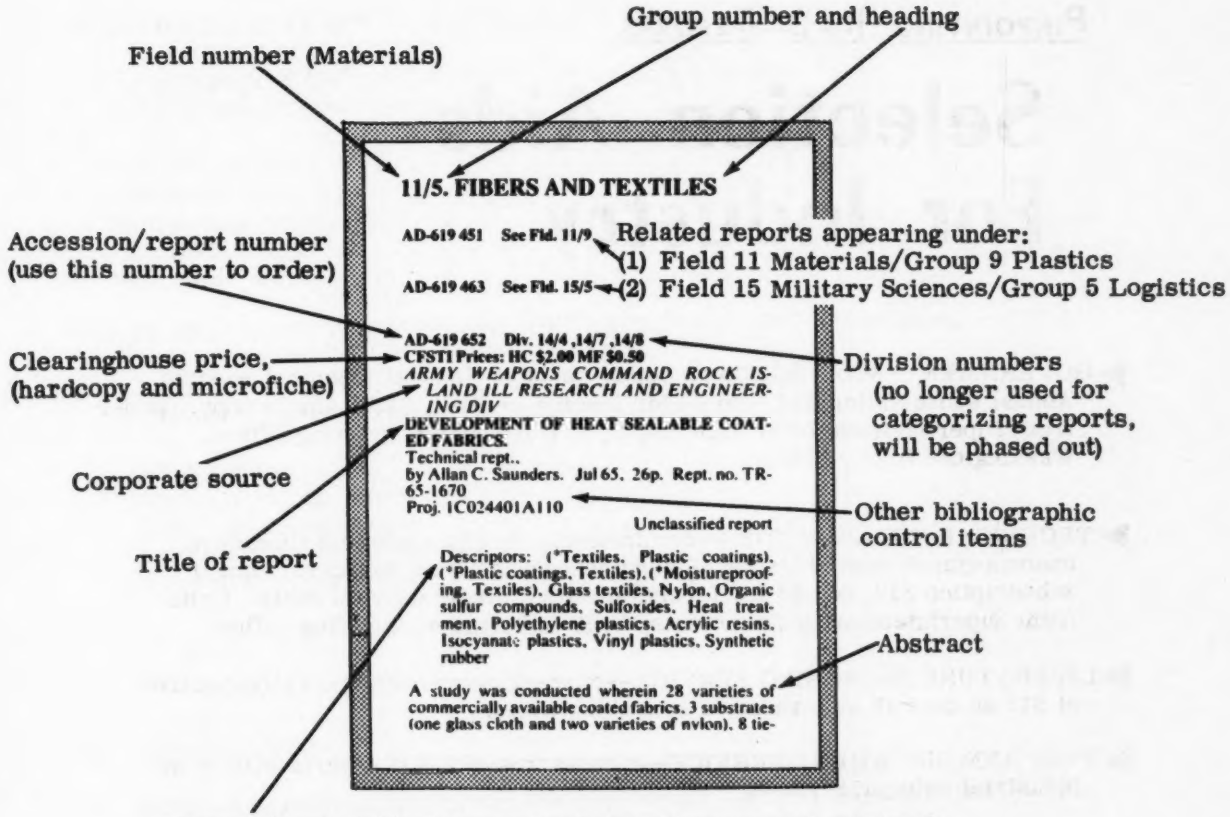
Automatic photocomposition of the USGRDR starts with the document records (indexing data and abstracts) prepared on punched paper tape at the Clearinghouse. This tape is then put through a series of computer conversion processes for insertion into automatic photocomposition equipment at the U. S. Government Printing Office. From the final computer input the photocomposition equipment produces page length columns with justified margins. These columns are then assembled into complete journal pages for photo-offset printing.

Advantages of the new format are the contrasting type faces and greater compactness, making the entries easier to scan. Perhaps of more intrinsic value is the new computer-directed cross-reference system that refers the reader to related reports announced under other Fields and Groups, some of which may at first appear to be remote from the reader's primary field of interest. Thus in the sample entry on the opposite page, the reader interested in Fibers and Textiles--Group 5 under Field 11 (Material)--is referred not only to an applicable report in Group 9 under the same Field, but also to a related report in Field 15/Group 5, (Military Sciences/Logistics).

As in all projects involving new equipment and procedures it is inevitable that some errors will occur. These will be eliminated in future issues.

The indexes to both sections of the journal will continue to be processed in the conventional manner without automatic photocomposition.

A SAMPLE ENTRY


Group number and heading
Field number (Materials)
11/5. FIBERS AND TEXTILES
Accession/report number (use this number to order)
AD-619 451 See Fld. 11/9
AD-619 463 See Fld. 15/5
Related reports appearing under:
(1) Field 11 Materials/Group 9 Plastics
(2) Field 15 Military Sciences/Group 5 Logistics
AD-619 652 Div. 14/4 ,14/7 ,14/8
Clearinghouse price, (hardcopy and microfiche)
CFSTI Prices: HC $2.00 MF $0.50
Division numbers (no longer used for categorizing reports, will be phased out)
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
Corporate source
DEVELOPMENT OF HEAT SEALABLE COATED FABRICS.
Technical rept.,
by Allan C. Saunders. Jul 65. 26p. Rept. no. TR-65-1670
Proj. 1C024401A110
Other bibliographic control items
Title of report
Unclassified report
Descriptors: (*Textiles, Plastic coatings), (*Plastic coatings, Textiles), (*Moistureproofing, Textiles), Glass textiles, Nylon, Organic sulfur compounds, Sulfoxides, Heat treatment, Polyethylene plastics, Acrylic resins, Isocyanate plastics, Vinyl plastics, Synthetic rubber
Abstract
A study was conducted wherein 28 varieties of commercially available coated fabrics, 3 substrates (one glass cloth and two varieties of nylon), 8 tie-
Descriptors: Subject terms used for reference and retrieval; starred descriptors appear in subject index.

NOTE: As a referral service only, some entries cite articles in non-Government journals, certain Government Printing Office publications, and similar documents which may be of interest to Clearinghouse customers.

The abundance of R & D reports available creates a problem for industry in extracting those most likely to prove of value--for technical solutions and in keeping up with new developments. These Clearinghouse tools and services are designed to narrow the search.

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▶ TECHNICAL TRANSLATIONS--semimonthly foreign technical literature announcement journal listing Government and private sources. Annual subscription $12, add $4 for foreign mailing, single copy 60 cents. Order from Superintendent of Documents, U. S. Government Printing Office.

▶ LITERATURE SEARCHING SERVICE--current awareness and retrospective at $11 an hour (8 hr. minimum searching time).

▶ FAST ANNOUNCEMENT SERVICE--summaries of R & D reports mailed by industrial categories, free.

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Sample list:
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SB-413 (Suppl. 1) Beryllium
SB-419 (Suppl. 1, Revised) Desalinization of Water
SB-475 (Suppl. 1) Information and Storage
SB-488 (Suppl. 2) Masers and Lasers

▶ PACKAGED REVIEWS--résumés, abstracts and bibliographies, free.
Sample list:
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OTR-129 Brazing Technology and Application
OTR-132 High Temperature Adhesives Above 500°F

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Includes astronomy; astrophysics; and celestial mechanics..... 3, S-2

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Includes atmospheric physics and meteorology..... 4, S-4

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Includes administration and management; documentation and infomation technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology. See also related field: 06 Biological and Medical Sciences..... 8, S-6

06 BIOLOGICAL AND MEDICAL SCIENCES

Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects. See also related fields: 02 Agriculture, 05 Behavioral and Social Sciences, and 07 Chemistry..... 16, S-7

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Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism. See also related field: 04 Atmospheric Sciences..... 33, S-19

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Includes conversion techniques; power sources; and energy storage. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 46, S-26

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17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

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18 NUCLEAR SCIENCE AND TECHNOLOGY

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology. See also related fields: 07 Chemistry, 15 Military Sciences, 18 Nuclear Science and Technology, 20 Physics, and 21 Propulsion and Fuels..... 66, S-43

19 ORDNANCE

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance. See also related field: 18 Nuclear Science and Technology..... 67, S-52

20 PHYSICS

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation. See also related fields: 03 Astronomy and Astrophysics, 07 Chemistry, 09 Electronics and Electrical Engineering, 10 Energy Conversion (Non-propulsive), 11 Materials, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 17 Navigation, Communications, Detection, and Countermeasures..... 68, S-53

21 PROPULSION AND FUELS

Includes air-breathing engines; combustion and ignition; electric propulsion; fuels; jet and gas turbine engines; nuclear propulsion; reciprocating engines; rocket motors and engines; and rocket propellants. See also related fields: 07 Chemistry and 20 Physics..... 83, S-64

22 SPACE TECHNOLOGY

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Bonding/Joining

ADHESIVE BONDING OF TITANIUM AND ITS ALLOYS

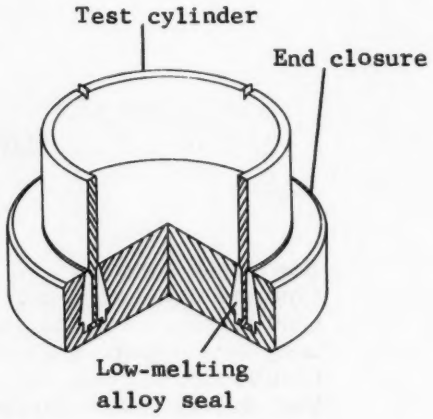
(Order AD-620 509 Adhesive Bonding of Titanium and Its Alloys, HC $3.00/ MF $0.75.)

Titanium alloys can be successfully bonded using established techniques and commercial adhesives, NASA's George C. Marshall Space Flight Center reports. Although most of the adhesive-bonding technology to date has been devoted to bonding of aluminum and steels, NASA workers now report success with titanium and its alloys. For successful production of quantities of adhesive bonded assemblies having uniformly high mechanical properties, careful inspection and quality control procedures are essential throughout the manufacturing process. Continual monitoring of adhesive characteristics, proper compositions of surface preparation solutions, adjustment of processing equipment, accuracy of process control instruments, and testing of joints are essential. Given such care in preparation, excellent bonding can be achieved in box beams, helically wrapped solid rocket-motor cases, integral fuel tanks, aircraft skin panels, rear-wing fittings, tankage, and variable air-inlet ramp parts.

JOINING AND SEALING DISSIMILAR MATERIALS

(Order N65-26638 A Technique for Joining and Sealing Dissimilar Materials, HC $0.25/MF $0.50.)

A novel attachment and sealing method which has many potential applications for boltless connection of pipes and tanks has been developed by the NASA Lewis Research Center. The method features male and female members and a low-melting point alloy of bismuth, lead, tin, and antimony for sealing the cavity between these two. The significant features of this joint construction are: ease of assembly and disassembly by simply heating the joint above the melting point of the filler alloy which does not form a wetted bond; reusability of the individual components; effectiveness of the pressure seal; minimum induced stress in the cylinder component; and the ability to connect dissimilar materials. The NASA developers say the basic concept can provide the basis for a family of fastening and sealing methods for pressure vessel construction, concentric pipes, structural seams, encapsulation, work holders, and plastic pipes.



Communications

TELEMETRY FM/FM BASEBAND STRUCTURE STUDY

(Order AD-621 139, Vol. I, and AD-621 140, Vol. II, Telemetry FM/FM Baseband Structure Study, Vol. I HC $4.00/MF $1.00; Vol. II HC $7.00/MF $1.50.)

A larger number of channels will be available, there will be a choice of constant- or proportional-bandwidth subcarrier channels, and there will be greater flexibility in operating parameters if the FM/FM structure is expanded. These are the findings made in a study for the Army by Electro-Mechanical Research, Sarasota, Fla. Their experimental evaluation of a laboratory telemeter demonstrated the feasibility of adding three proportional-bandwidth channels to the standard IRIG baseband at center frequencies of 93, 124, and 165 kc. With the exception of signal-to-noise performance, no significant degradation occurs when the expanded baseband is used. The expanded baseband signal-to-noise performance is reduced 12 db compared with that of the standard IRIG baseband, but the reduced performance should not be considered a penalty. The equipment evaluation portion of EMR's program showed that typical field equipment can be used successfully with an expanded proportional-bandwidth baseband. The exceptions found were in equipment that had been designed with an upper frequency limit of 70 kc. However, the most modern equipment presently available is capable of operating at the extended frequencies.

Coatings

NEW NASA INORGANIC COATINGS

(Order N65-15535 NASA Contributions to the Technology of Inorganic Coatings, MF $1.50. Hardcopy available from Superintendent of Documents, GPO, Washington, D.C., 20402, $1.00.)

New combinations of inorganic coatings have been developed for NASA to satisfy the rigorous environment of space such as the extremes of high and low temperatures; the ultra-high vacuum; ultraviolet, solar-proton, and cosmic-ray irradiation; and micrometeorite erosion. The Denver Research Institute in a technology survey made for NASA reports that these coatings and coating techniques will have important commercial applications. Thermophototropic coatings, for example, assure new optical devices whose optical properties actively respond to light intensity. New thermal control coatings can be used for solar energy conversion systems and thermal radiation control. Certain solid lubrication coatings developed for high- and low-temperature space applications should lead to the development of specialized and improved lubricants for commercial uses. Thermal insulation coating concepts should assist the development of industrial high-temperature thermal insulations. Parametric studies of coating application methods have improved the coating-to-substrate bonding techniques. Devices and techniques developed by NASA for measuring various optical properties may prove to be commercially useful. And refractory metal coatings after suitable development will yield a new group of high-temperature structural materials.

Data Processing

MAN-COMPUTER COMMUNICATION USING CONVENTIONAL ENGLISH

(Order AD-612 165 Deacon Breadboard Processing, HC $3.00/MF $0.75; a companion report is also available--AD-612 171 Deacon Breadboard Grammar, HC $5.00/MF $1.00.)

Recent Government-sponsored R and D has advanced the field of man-machine communication to the point where computer systems can now be built using conventional English for instruction. This is a significant development because present-day computers require highly specialized language prepared by programmers. A report available from the Clearinghouse describes the work of General Electric for the Air Force on the DEACON (Direct English Access and Control) experimental computer model. Although this model has not been perfected, GE says it clearly establishes the feasibility of using conventional English for in-put and control, and it points the way toward the design of a prototype computer that will work. To achieve understanding, the computer will come equipped with counterparts to conventional English, and it will be able to interpret sentences fed to it. Thus, within a limited vocabulary, the computer will make decisions not only about the particular spatial relationships of the words in a sentence, but also about the meaning of the words and the semantic implications of the structure in which they are found.

THIN FILM VACUUM DEPOSITION FACILITY

(Order AD-621 065 The NAFI Thin-Film In-Line Vacuum Deposition Process, HC $6.00/MF $1.50.)

Pilot-line production of thin-film microelectronic circuits at the Indianapolis Naval Avionics Facility is described in depth in a manual prepared by the Navy. The document offers valuable information on equipment, process flow and control, materials, processing and circuit fabrication sequences, thin-film circuit layout and design, and mask fabrication. Built in mid-1962 by IBM to serve as a model for a Navy industry preparedness program of in-line vacuum deposition process and equipment, the facility uses some of the latest techniques and equipment and has been steadily improved over the past three years. The essential process of the facility is one in which passive thin-film circuit elements are vaporized in a vacuum chamber and deposited on a Pyrex substrate using a through-mask technique. This is a semi-automatic operation with a potential of becoming fully automated.

INDEX TO EPIC COLLECTION PUBLISHED

(Order AD-615 409 Electronic Properties Information Center - Index to the Collection, Part I: The Coordinate Index, Acenaphthene to Indium Palladium, HC $11.45/MF $3.50.)

(Order AD-615 410, same title, Part I: The Coordinate Index, Indium Phosphide to Zirconium Telluride, HC $10.90/MF $3.25.)

(Order AD-615 411, same title, Part II: Bibliography, Accession Numbers 101 to 6357, HC $7.00/MF $1.75.)

(Order AD-615 414, same title, Part II: Bibliography, Accession Numbers 6358 to 13,600, HC $7.10/MF $2.00.)

The first published bound Index to the Collection of the Electronic Properties Information Center consists of a two-volume Coordinate Index and a two-volume Bibliography of 13,500 citations. The Coordinate Index contains descriptors of materials followed by properties, both alphabetically arranged. The accession numbers of the literature appropriate to the material and property descriptors follow, referring the user to the entries in the Bibliography.

EPIC has organized the Coordinate Index into nine major categories of materials. While not mutually exclusive, these categories tend to group materials by significant characteristics. Although categorizing the materials is a useful device to certain users, arbitrary standards have been developed because there is no material which is exclusively a metal, a semiconductor, or a thermionic emitter. Under various environments and conditons, materials are observed experimentally and the effects can be measured and perhaps explained theoretically. These observed and measured effects are the properties of the materials. For instance, you will find ferroelectrics that are semiconductors; some metals at low temperatures are superconductors; and ferrites are a class of insulators having certain magnetic properties. The indexing method evolved has therefore been largely to ignore property concepts as to the categorization of specific materials and to index a publication as it treats of the material. (Continued next page.)

EPIC's Index to the Collection is the first of what may in the future run into many editions, with present plans calling for regular updating. Purchasers of the present Index can write to the Clearinghouse and their names will be placed on a mailing list for notification of availability and prices of updated reports.

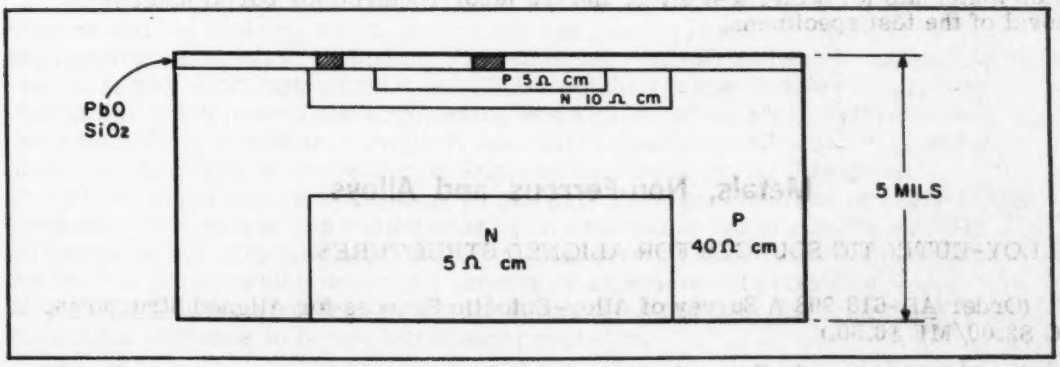
MOLECULAR 4-LAYER INTEGRATED SWITCHES WITHSTAND HIGH VOLTAGE

(Order AD-621 371 Final Report: Study of Microcircuitry Techniques Utilizing Molecular Engineering, HC $3.00/MF $0.75.)

Four-layer integrated switches and non-linear resistors to withstand moderately high voltage have been developed for use in compact pulse amplifiers. Westinghouse, who designed and fabricated the amplifiers for the Navy using molecular electronic techniques, believes "the development of this pulse amplifier marks the first time a four-layer switch structure has been used in integrated circuits in such an application and, as such, represents a worthwile contribution to the microcircuitry field. Certainly the four-layer switches and non-linear resistor will find extensive use in future applications."

The Navy-sponsored program, primarily designed to study molecular electronic techniques, resulted in the development of both high voltage-low sustaining current four-layer switches and high voltage-low saturation current non-linear resistors. According to Westinghouse: "The novel use of the non-linear or field effect resistors not only made a very practical molecular amplifier design possible, but also resulted in substantial power economies on a system level."

The design of the four-layer switch makes use of the evolving technology in fabrication. It has exhibited, says Westinghouse, significant growth potential. The initial starting material is 40 ohms/cm p-type silicon mechanically prepared by cutting, lapping, and polishing to proper size and shape. The Westinghouse report gives the complete switch fabrication process step-by-step. It similarly treats the fabrication of the resistor network and conventional and avalanche diodes.



Cross Section of Four-Layer Structure

Engineering and Construction

NBS UNDERGROUND CORROSION BOOK BACK IN PRINT

(Order PB-168 350 Underground Corrosion, HC $6.00/MF $1.25.)

Underground Corrosion, an out-of-print book that contains basic reference data found nowhere else, is back in print and available from the Clearinghouse. The book gives data gleaned by the National Bureau of Standards in its studies of metallic structures buried in soils or in contact with soils from 1910 to 1955. In these field and laboratory investigations, NBS studied what has long been a serious engineering and economic problem for public utilities, municipalities and, indeed, every nation that moves drinking water and sewage through underground facilities, transports oil and gas through pipelines, and buries its communication, signal, and power cable systems.

For the first decade of the 45-year study, NBS confined its study to corrosion due to stray-current electrolysis and its mitigation. When it became apparent that serious corrosion occurred in soils under conditions that precluded stray-currents as an explanation, NBS scientists and engineers then began a field burial program to get information on the effect of soil properties on the corrosion of metals. They exposed more than 36,500 specimens representing 333 varieties of ferrous, nonferrous, and protective coating materials in 128 test locations throughout the United States. During this time they continuously made laboratory studies of the electrical and electrochemical aspects of underground corrosion. Data gained from both field and laboratory investigations are set forth in the comprehensive reference work, familiarly known to corrosion specialists as NBS Circular 579.

Underground Corrosion aims to provide a useful reference for the technician who is interested in the theoretical aspects of underground corrosion, and for the engineer who may be interested only in the practical aspects of the methods commonly used for the prevention of corrosion. It includes many references to industrial studies and field experiences related to the Bureau's underground corrosion investigations. During the course of the ambitious long-time study, NBS had the cooperation of many utilities, technical associations, and manufacturers who supplied materials for tests, test sites, and the labor required for burial and removal of the test specimens.

Metals, Non-Ferrous and Alloys

ALLOY-EUTECTIC SOURCES FOR ALIGNED STRUCTURES

(Order AD-618 998 A Survey of Alloy-Eutectic Sources for Aligned Structures, HC $2.00/MF $0.50.)

An Army survey of alloy-eutectic sources for aligned structures judges that 77 binary systems are unfavorable for production of whisker (or aligned lamellae) structures. However, the Army researchers find that 28 are promising for useful aligned structures. As a rough estimate, there are probably about 30 more binary

systems involving refractory metals (and a few rare earth metals) that may be worth investigation. As yet, it cannot be predicted that specific eutectic reactions will produce aligned structures by the process of unidirectional cooling. Some systems after aligning of structure may be benefited by heat-treatment and some by cold-working below recrystallization temperature. Eutectic systems reacting at temperatures above 800°C involve specific development of containment materials, methods of heating and cooling, and controlled atmospheres. Several methods are available for controlling the alignment process. There also appears to be a possibility for high pressure to increase the volume quantities of whisker phases in the eutectic when the normal melting point of the whisker phase is lower than that of the related terminal solid solution.

Nuclear Technology

NEW TRAINING MANUAL OUTLINES OPERATION OF TEST REACTORS

(Order IDO-16871-1, Vol. I of Fundamentals in the Operation of Nuclear Test Reactors: Reactor Science and Technology, HC $2.50.

IDO-16871-2, Vol. II: Materials Testing Reactor Design and Operation, HC $2.75.

IDO-16871-3, Vol. III: Engineering Test Reactor Design and Operation, HC $3.00.

IDO-16871-4, Vol. IV: Engineering and Design Considerations for In-Pile Tests, HC $7.00.)

Fundamentals in the Operation of Nuclear Test Reactors, a four-volume training manual, gives the basic background information essential to a clear understanding of the problems associated with the safe and efficient operation of nuclear test reactors and their associated experimental programs. It is specifically concerned with the irradiation test program in the Materials Testing Reactor (MTR) and Engineering Test Reactor (ETR) at the Phillips Petroleum Idaho Falls facility.

The manual consists of four separate phases of instruction: (1) Reactor Science and Technology, which covers nuclear physics, reactor physics, engineering, chemistry, metallurgy, kinetics and control, and safety as applied to reactors, and basic instrumentation; (2) Materials Testing Reactor Design and Operation, which covers the engineering description of the MTR, control components and instrumentation, circuitry, operation, shutdown and tank work, and supplemental facilities at the MTR; (3) Engineering Test Reactor Design and Operation, which covers all aspects of the ETR in its performance of engineering tests on fuel elements and components of nuclear plants under conditions simulating the actual proposed application; (4) Engineering and Design Consideration for In-Pile Tests, which describes aspects of experimental programs at the MTR-ETR facility involving the effects of radiation fields on the materials and structural elements to be used in nuclear reactors.

Phillips Petroleum compiled the manual over a two-year period for use in their AEC-sponsored training program for MTR-ETR operators at the National Reactor Testing Station. The training consists of a one-year course of study for graduate engineers or those with degrees in relevant sciences.

A SINGLE-PURPOSE WATER DESALTING NUCLEAR PLANT

(Order COO-283 Deep-Pool Reactor for Water Desalting, HC $5.00.)

An output of 200 million gallons of water a day at an approximate cost of 42 cents per 1,000 gallons can be achieved with a single-purpose water desalting nuclear plant designed by the Bechtel Corporation for the AEC. A $178 million cost estimate to build the plant is for a typical southern California site. Bechtel says it is conceivable that the cost per 1,000 gallons could be reduced by continuing advancements in nuclear technology. The safety advantages inherent in the essentially unpressurized deep-pool reactor concept were used by the developers in plant design. The reactor consists of a conventional water reactor core located in the bottom of a 150-foot deep tank; the tank is located within a concrete structure with the reactor core about 90 feet below grade. Since the reactor coolant outlet temperature is 270°F, the designers obtained a more efficient thermodynamic system by dividing the water plant into three separate units, each operating at a different maximum brine temperature.

Power Source Devices

A LONG-LIFE THERMAL CELL

(Order N65-27818 A Long-Life Thermal Cell, HC $1.00 MF $0.50.)

Primary thermal cells using molten salt electrolytes have been constructed with service lives measured in days. Developed by the Lewis Research Center, the cells consist of magnesium anodes, mixed copper oxide cathodes, and an electrolyte of the eutectic mixture of lithium chloride and potassium chloride. One cell that was discharged over a period of 6 days failed when the anode became disconnected. This type of failure was prevalent during this investigation and in no way reflects the ultimate periods of usefulness of this type of cell. A different anode design would enable more of the useful energy to be withdrawn from the cell. The self-discharge characteristics of the cell are what limits the period of usefulness. The cell that was discharged over a period of 6 days had an anode efficiency of 73 percent, which shows that 27 percent of the anode either flaked off, was consumed by internal discharge reactions, or reacted with the impure electrolyte during its operation. The Lewis researchers believe better salt drying techniques will extend its operating time beyond 6 days. The cell has a wide operating temperature ranging from about 670 to about 1200°F, indicating potential space applications.

TECHNICAL ABSTRACT BULLETIN

1/2. AERONAUTICS

AD-623 158 Div. 1/4
CFSTI Prices: HC $2.00 MF $0.50
WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF
BASIC MECHANISMS OF NOISE GENERATION BY HELICOPTERS, V/STOL AIRCRAFT, AND GROUND EFFECT MACHINES,
by M. V. Lowson. May 65, 39p. Rept. no. WR-65-9

Unclassified report

Descriptors: (*Noise, Aircraft), (*Helicopters, Noise), (*Short take-off planes, Noise), (*Ground effect machines, Noise), Vertical take-off planes, Acceleration, Stresses, Force (Mechanics), Sources, Airplane noise, Engine noise

The basic mechanisms of noise generation due to mass introduction, applied force and applied stress are discussed with reference to their implications for helicopters, V/STOL aircraft, and Ground Effect Machines. The significance of the dimensional dependence of monopole, dipole and quadrupole fields is shown. The results of a new theory giving the effects of system accelerations on noise are presented. This theory will often have application to noise problems for these machines because of the centrifugal accelerations associated with many of the noise generating components. System accelerations give rise to higher order poles in the sound field which become particularly important at high speeds. An expression for the sound field produced by fluctuating lift and drag forces in a rotating and convected system is given. As a further example of the application of the general theory the sound field radiated by a hovering helicopter is analyzed. It is shown how a previously unrecognized source of sound arises from the outward components of force induced by the effects of blade coning angle and lag. The source of sound has its maximum in the plane of the rotor disc. The importance of including the proper momentum terms in calculations of noise radiated by moving mass sources is demonstrated. (Author)

AD-623 296 Div. 1/5 ,13/11
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
A STUDY OF THE GAS TURBINE POWERED MB-5 AIRCRAFT FIREFIGHTING AND RESCUE VEHICLE.
Final rept.,
by H. B. Peterson, and R. L. Gipe. 22 Sep 65, 27p. Rept. no. NRL-6309
Proj. SEQ621 001 6521F012 05 04

Unclassified report

Descriptors: (*Firefighting vehicles, Aircraft), (*Crash vehicles, Aircraft), (*Gas turbines, Tests), Aircraft fires, Fire safety, Human engineering, Pumps, Acceleration, Performance (Engineering)

One of the MB-5 series of crash trucks was equipped with a gas turbine engine as a source of power. During the testing of this vehicle the operating characteristics of the engine were monitored under different load conditions, variable road speed, and variable foam pump speed. The turbine powered vehicle was compared to other, conventional engine model, trucks now in operation, both for rapidity of acceleration and for ease of operation. A standardized simulated firefighting operation called a 'scramble' operation was devised for the integration of human engineering with the relative efficiency of each of the three vehicles. Time intervals required to reach a given series of check points during a fixed firefighting procedure were recorded by multichanneled instrumentation or by observation. The turbine-powered vehicle proved to be superior in acceleration performance and equal in firefighting capability to conventional engines. These factors alone may not justify the higher initial cost of turbine power plant. (Author)

AD-623 306 Div. 1/4 ,19/3 ,33/1
CFSTI Prices: HC $5.00 MF $1.00
BOLLAY (E) ASSOCIATES INC GOLETA CALIF
ATC WEATHER PRESENTATION STUDIES FOR THE NATIONAL AIRSPACE SYSTEM.
Final rept.,
by D. Goodale, and G. Pearson. Aug 65, 151p.
Contract FAWA4403 Proj. 131 311 05A Task 4-12
SRDS , RD-65-15

Unclassified report

Descriptors: (*All-weather aviation, Air traffic control terminal areas), (*Air traffic control terminal areas, Weather communications), (*Weather communications, Air traffic control terminal areas), Meteorological parameters, Display systems, Airport control towers, Aviation safety, Aeronautics

Detailed studies were made of the ATC controllers' weather information requirements in the ARTC Center, A/D Facility, and Tower Cab. The results have been tabulated in terms of the weather parameter, display format, and updating required for each control function in each facility. A system concept has been developed to optimize the display of weather information to each facility. The concepts presented are designed to be consistent with the time period of the NAS Stage A, Model I. The dissemination of each individual weather product through the appropriate control levels of the ATC complex has been illustrated through the use of information flow diagrams which correlate display concepts with control functions. The display techniques to be used throughout the system were described as to function, formats, and the means of driving the display. These included high speed printers, strip printers, I/O typewriters, weather radar PVD displays, electromechanical ndicators, alpha-numeric CRT displays, and a large screen display. (Author)

AD-623 514 Div. 1/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY AVIATION TEST ACTIVITY EDWARDS AFB CALIF
PRELIMINARY PILOT QUALITATIVE EVALUATION OF THE XV-5A RESEARCH AIRCRAFT.
Letter rept.
28 Oct 65, 48p.

Unclassified report

Descriptors: (*Vertical take-off planes, Flight testing), Flight control systems, Research planes, Turbojet engines, ' andings, Operation, Stability, Fans

The primary objobjective of the tests was to investigate those aircraft characteristics directly influenced by the Lift-Fan concept. The report contains the results of the preliminary pilot evaluation of the XV-5A aircraft during the stability and control portion of the U. S. Army flight test program.

AD-623 575 Div. 1/5 ,1/2
CFSTI Prices: HC $3.00 MF $0.75
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
CRASHWORTHY DESIGN PRINCIPI ES.
Technical rept.,
by D. L. Greer, J. S. Breeden, and T. L. Heid.
Sep 64, 84p. Contract FA WA4583
FAA-ADS , 24

Unclassified report

Descriptors: (*Transport planes, Aviation safety), (*Aviation safety, Transport planes), Aircraft seats, Aviation injuries, Aviation accidents, Safety harness, Airframes, Impact shock, Toughness, Structural properties, Design

The study was performed to develop design principles and techniques that will increase transport aircraft passenger and crew survivability in accidents resulting from aborted takeoffs, short landings, overshoots, wheels-up landings, or ditchings. The three primary areas of study are: (1) mechanisms of failure and energy-absorbing structure related to primary airframe structure, (2) delethalization related to occupant restraint and the prevention of injury, and (3) evacuation as affected by structural considerations. (Author)

AD-623 303 **See Fld. 17/7**

1/3. AIRCRAFT

AD-623 100 Div. 1/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
EFFECTS OF WEIGHT, INERTIA, AND VELOCITY ON CONTROL POWER REQUIREMENTS FOR VTOL AIRCRAFT.
Master's thesis,
by Byron Harl Romine. Aug 65, 71p. Rept. no. GE/EE/65-20

Unclassified report

Descriptors: (*Vertical take-off planes, Stabilization systems), (*Stabilization systems, Power), Stability, Control systems, Weight, Velocity, Roll, Ailerons

The pilot-vehicle systems analysis is applied to the problem of determining the effects of gross weight, inertia, and velocity on the stabilization control power requirements for the single-loop roll control system of a DOAK VZ-4 VTOL aircraft. The aircraft is subjected to random roll inputs in the form of atmospheric distrubances. Only the control power required to stabilize the aircraft roll angle by the pilot's use of ailerons alone is considered. The open-loop gain of the system is determined by maximizing the closed-loop damping ratio. There are no significant differences in the stabilization control power requirements at the gross weight conditions analyzed. Increased moments of inertia do not drive the system unstable, but the control power requirements decrease by about sixty per cent as the moments of inertia are increased from 2800 slugsq ft to 3300 slug-sq ft. (Author)

AD-623 120 Div. 1/2 ,12/1 ,28/3
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE FLIGHT DYNAMICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EGRESS FROM A SINGLE PLACE CREW STATION IN A WEIGHTLESS ENVIRONMENT.
Final technical rept. for 1 Feb 64-1 Apr 65,
by Edward O. Roberts. Sep 65, 43p. Rept. no. FDL-TR-65-148
Proj. 1425 Task 142502

Unclassified report

Descriptors: (*Aerospace craft, Hatches), (*Human engineering, Aerospace craft), Weightlessness, Pilots, Flight clothing, Reaction (Psychology), Reflexes, Test equipment, Statistical analysis, Tables

The report presents the results of an in-house test program to establish design criteria for crew stations as related to crewmember egress from a single place pilot's station in a weightless environment. The objectives were to investigate the egress problems associated with the panel layout of a minimum volume crew station and to establish optimum location of an overhead hatch for crewmembers wearing regular flight suits during an emergency egress condition. A simulated single place crew station was designed and fabricated in-house and mounted in the Aeronautical Systems Division's zero gravity aircraft. An overhead hatch bulkhead was designed to be adjustable which allowed the egress task to be performed at different locations from the seat reference point (SRP). Three hatch locations were used. In the first series of tests the hatch opened outward from the crew station and was tested at the three locations; in the second series the hatch was tested at the maximum distance from the SRP but opened inward. Three times were recorded for the egress task; reaction time, egress to the hatch, and egress through the hatch. Three subjects were used to give six replications for each hatch location. The data were statistically analyzed using F ratio and t tests and the results indicated that egress through an inward opening hatch took 1 1/2 to 2 times longer than to egress through the hatch that opened outward. The time required to egress to the hatch proved to be what would be expected; the time increased as the hatch distance to the SRP increased. (Author)

AD-623 129 Div. 1/8 ,1/9
CFSTI Prices: HC $4.00 MF $0.75
BOEING CO MORTON PA VERTOL DIV
DESIGN AND WIND TUNNEL TEST OF A MODEL HELICOPTER ROTOR HAVING AN INDEPENDENTLY MOVABLE INBOARD BLADE PANEL.
Final rept.,
by Donald G. Ekquist. Oct 65, 102p. Rept. no. R-420
Contract DA44 177AMC129T Task 1P125901A13903
USAAVLABS , TR-65-63

Unclassified report

Descriptors: (*Helicopter rotors, Model tests), (*Rotor blades (Rotary wings), Model tests), Design, Wind tunnel models, Propulsion, Lift, Power, Performance (Engineering), Control systems

Wind tunnel tests of a rotor having an independentlymovable inboard blade panel were conducted at an advance ratio of 0.6. It was demonstrated that this design resulted in a major advance in propulsive capability over the conventional type of rotor. Test results are presented in nondimensional plots of lift, power, and propulsive force versus control axis angle, and in cross-plotted contours of constant power of lift versus propulsive force axes. (Author)

AD-623 527 Div. 1/8 ,1/9
CFSTI Prices: HC $3.00 MF $0.75
VTOL SYSTEMS DIV CURTISS-WRIGHT CORP CALDWELL N J
A THEORY FOR VTOL PROPELLER OPERATION IN A STATIC CONDITION.
Final rept. for Jun 64-May 65,
by John C. Erickson,Jr., Richard M. Ladden, Henry V.Borst, and Donald E. Ordway. Oct 65, 85p. Contract DA44 177AMC165T Proj. 1M121401D14415
USAAVLABS , TR-65-69

Unclassified report

Subcontracted to Therm Advanced Research, Inc., Ithaca, N. Y.

Descriptors: (*Vertical take-off planes, Propellers (Aerial)), (*Propellers (Aerial), Performance (Engineering)), Lift, Vortices, Wake, Statics, Theory, Deformation, Programming (Computers), Mathematical analysis

A general theory for performance calculations was formulated based on a continuous vortex representation along the lines of the classical lifting-line model. As opposed to forward flight, the deformation of the wake is appreciable just behind the propeller, and its determination constitutes the heart of the static problem. A computer program has been developed to calculate both the inflow at the propeller and the induced velocity at any field point for an arbitrary description of the trailing vortex sheets. To approximate the force-free condition imposed on the wake, an initial wake hypothesis derived from the theory of the Generalized Actuator Disk was first used. The resulting comparisons with both detailed and gross measurements were unsatisfactory and a refined hypothesis was derived. The refined wake hypothesis provides a more reasonable representation of the 'pitch' of the elements of the deformed trailing vortex sheets as well as the envelope of their trajectories. (Author)

AD-623 531 Div. 1/9
CFSTI Prices: HC $7.00 MF $1.75
SIKORSKY AIRCRAFT DIV UNITED AIRCRAFT CORP STRATFORD CONN
POWER TRANSMISSION STUDIES FOR SHAFTDRIVEN HEAVY-LIFT HELICOPTERS.
Final rept. for 30 Jun 64-15 Feb 65,
by Lester R. Burroughs. Oct 65, 312p. Rept. no. 50401
Contract DA44 177AMC240T Task 1M121401D4414
USAAVLABS , TR-65-40

Unclassified report

Descriptors: (*Helicopters, Transmissions), (*Transmissions, Design), Drive shafts, Transmission gears, Power, Drives, Bearings, Turbines

The report covers a 6-month design investigation of transmission system concepts capable of operation in a single-rotor heavy-lift helicopter of 75,000 to 95,000 pounds gross weight. The study covered the selection of engines, considering engine installations utilizing models of four different engines. Specific areas considered in the design included the study of high-speed bevel gears and bearings utilized in the initial reduction stages, hightorque lightweight planetary gearing and bearings, and the design of hypercritical shafting systems. The results of this study indicate that the total power transmission system weight for a single rotor HLH is approximately 8,850 pounds. This weight, which includes all gearboxes, shafting, rotor brake, and lubrication systems, is approximately 7 percent less than the results of earlier studies. The mechanical efficiency of this transmission system is greater than 96.2 percent. Studies of alternate drive concepts including the harmonic drive, the roller gear drive, and redundant power path gearing systems indicate the suitability of the roller drive for inclusion in the HLH transmission system, since this concept may afford a weight saving as high as 10 percent over conventional planetary drives. A comparative reliability analysis of the HLH and a current model aircraft designed for similar mission operation is included. (Author)

AD-623 111 See Fld. 1/4

AD-623 128 See Fld. 11/7

AD-623 575 See Fld. 1/2

1/4. AIRCRAFT FLIGHT INSTRUMENTATION

AD-623 111 Div. 1/1 ,1/9
CFSTI Prices: HC $3.00 MF $0.75
LOCKHEED-CALIFORNIA CO BURBANK
EVALUATION OF A MECHANICAL SERVOACTUATOR FOR FLIGHT CONTROL SYSTEMS.
Technical rept. for Jul 64-Feb 65,
by O. A. Knuusi, and W. R. Sage. Oct 65, 94p. Rept. no. LR-18636
Contract DA44 177AMC232T Task 1P121401A141
USAAVLABS , TR-65-62

Unclassified report

Prepared in cooperation with Curtiss Div., Curtiss-Wright Corp.

Descriptors: (*Flight control systems, Actuators), (*Actuators, Servomechanisms), (*Servomechanisms, Flight control systems), (*Helicopters, Flight control systems), Tests, Simulation, Feasibility studies, Hysteresis, Mechanical properties, Performance (Engineering), Loading (Mechanics), Failure (Mechanics), Noise

A prototype mechanical servo-actuator was tested under simulated loads to determine its suitability for use in powering flight control systems for helicopters. Tests included frequency response, step response, threshold, hysteresis, endurance, and emergency operation, and were compared with similar tests of a typical hydraulic servo. Recommendations are made regarding design changes for further investigation. (Author)

1/5. AIR FACILITIES

AD-623 102 Div. 33/1
CFSTI Prices: HC $2.00 MF $0.50
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
CAPACITY OF AIRPORT SYSTEMS IN METROPOLITAN AREAS.
Final summary rept.,
by M. A. Warskow, and I. S. Wisepart. Jan 64, 37p. Rept. no. AIL-1400-3
Contract FAA BRD403

Unclassified report

Descriptors: (*Airports, Urban areas), Air traffic, Scheduling, Operation, Civil aviation, Runways, Taxiing, Air traffic control systems, Navigational aids, Graphics

Since airports in metropolitan areas complement and interact with each other, they must be planned and operated as part of a system of airports. Furthermore, as air traffic continues to increase, more airports in metropolitan areas approach and reach capacity operation. Therefore, it is desirable to plan each airport in a metropolitan area as part of a system of airports in order to obtain the most efficient traffic flow, as well as the most efficient use of facilities. The operational factors involved in planning a system of airports in metropolitan areas are analyzed and used to determine the causes of congestion. Data obtained from previous studies is used to understand and demonstrate the operational factors and congestion. Airport congestion is defined in quantitative form for an individual airport and a system of airports. A methodology is presented that permits the many factors affecting the operation of an airport in a metropolitan system area to be evaluated quantitatively. The annual demand at which these airports will reach their practical annual capacity is determined by considering the effects of airport interactions and by determining quantitatively when congestion will occur at one airport and in the airport system. (Author)

AD-623 134 Div. 33/1
CFSTI Prices: HC $4.00 MF $0.75
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
CAPACITY OF AIRPORT SYSTEMS IN METROPOLITAN AREAS: METHODOLOGY OF ANALYSIS.
Final rept.,
by M. A. Warskow, and I. S. Wisepart. Jan 64, 116p. Rept. no. AIL-1400-4
Contract FAA/BRD403

Unclassified report

See also AD-623 102.

Descriptors: (*Airports, Urban areas), Air traffic, Scheduling, Operation, Civil aviation, Runways, Taxiing, Navigational aids, Air traffic control systems, Graphics, Tables

Since airports in metropolitan areas complement and interact with each other, they must be planned and operated as part of a system of airports. Furth-

ermore, as air traffic continues to increase, more airports in metropolitan areas approach and reach capacity operation. Therefore, it is desirable to plan each airport in a metropolitan area as part of a system of airports in order to obtain the most efficient traffic flow, as well as the most efficient use of facilities. The operational factors involved in planning a system of airports in metropolitan areas are analyzed and used to determine the causes of congestion. Data obtained from previous studies is used to understand and demonstrate the operational factors and congestion. Airport congestion is defined in quantitative form for an individual airport and a system of airports. A methodology is presented that permits the many factors affecting the operation of an airport in a metropolitan system area to be evaluated quantitatively. The annual demand at which these airports will reach their practical annual capacity is determined by considering the effects of airport interactions and by determining quantitatively when congestion will occur at one airport and in the airport system. (Author)

AD-623 306 See Fld. 1/2

AD-623 583 See Fld. 15/5

2/3. AGRICULTURAL ENGINEERING

AD-623 087 See Fld. 15/3

3/1. ASTRONOMY

AD-623 109 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
PHYSICAL VIEWS ON THE ORIGIN OF THE UNIVERSE,
by Albert Wilson. Oct 65, 19p. Rept. no. P-3247
Unclassified report

Descriptors: (*Solar systems, Theory), (*Astronomy, Theory), Extraterrestrial topography, Stars, Planets, Interstellar matter, Sources

AD-623 113 Div. 2/1 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS ORIENTAL SCIENCE LIBRARY
A STATISTICAL STUDY OF THE RELATION BETWEEN SOLAR FLARES AND MAGNETIC STORMS,
by Jiang Bai-gin. Aug 65, 21p. Rept. no Emm-65-9
Contract AF19 628 5073
TT , 65-64339
Unclassified report

Trans. of Ti Ch'iu Wu Li Hsueh Pao (Chinese People's Republic) v9 n1 p38-46 1960. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Solar flares, Magnetic storms), (*Magnetic storms, Solar flares), Astrophysics, Geophysics, Correlation techniques, China

AD-623 276 Div. 2/1 ,25/5
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
COSMOLOGY IN TERMS OF OBSERVABLES,
by Dominic G. B. Edelen. Oct 65, 27p. Rept. no. RM-4652-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.

Descriptors: (*Astronomy, Field theory), (*Relativity theory, Field theory), Operators (Mathematics), Statistical mechanics, Tensor analysis, Galaxies

Under the assumption that the Einstein field equations hold locally (in our stellar neighborhood), a system of field equations is obtained for aggregates through the use of an observation operator. This operator converts any tensor field into a corresponding tensor field of observables and accounts for both intrinsic errors, such as optical resolution, and any loss of information due to averaging or ensemble representations. The aggregate field equations are shown to require a reevaluation of all physical interpretations associated with previous relativistic cosmological models if the Einstein field equations hold locally. A basis for the reevaluation is given, together with conclusions concerning the cosmological metric tensor. In addition, a basic indeterminism in any relativistic cosmology is demonstrated, both in the field equations and in the equations of motion. (Author)

AD-623 282 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
OLBERS' PARADOX AND COSMOLOGICAL MODELS,
by A. G. Wilson. Oct 65, 21p. Rept. no. P-3256
Unclassified report

Prepared for presentation to the Los Angeles Astronomical Society at Griffith Observatory, 14 Jun 65.

Descriptors: (*Astronomy, Scientific research), Stars, Distribution, Night sky, Sky brightness, Theory, Classification

A review of Olbers' Paradox is given; it is noted how Olbers' assumptions, postulated in 1826, can be used to classify generically the current cosmological models. Hierarchal homogeneity was examined as a basis for new types of cosmological models. The assumption of hierarchal distribution of matter is suggested to account for the observed night-sky brightness.

AD-623 292 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
NOTE ON THE SHAPE AND INTERNAL STRUCTURE OF THE MOON.
Mathematical note,
by C. L. Goudas. Jul 65, 7p. Rept. no. MN-418,D1-82-0454
Unclassified report

Also available from the author.

Descriptors: (*Moon, Configuration), (*Astronomy, Moon), Extraterrestrial topography, Lunar environment

On the basis of the best measurements available to date, the assumption that the elevation of the lunar maria is systematically smaller than the elevation of the continents is shown herein to be unjustified. As a result, the figure of the Moon cannot be studied from the distribution of maria on its surface, as Lamar and McGann have suggested in their paper (in press, ICARUS, 4) discussed here. (Author)

AD-623 297 Div. 2/1
CFSTI Prices: HC $3.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH GEO-ASTRO PHYSICS LAB
RADIATIVE COOLING OF STELLAR MATERIAL WITH APPLICATIONS TO SOLAR FLARES,
by Ludwig Oster. Sep 65, 51p. Rept. no. D1-82-0420
Unclassified report

Also available from the author.

Descriptors: (*Solar flares, Thermodynamics), (*Stars, Thermodynamics), (*Astrophysics, Heat transfer), Gases, Nebulae, Thermal radiation, Cooling, Equations of state

Characteristic times for the cooling of stellar material by spontaneous emission for temperatures between 10 to the 7th power and 10,000K, and for gas pressures corresponding to log P sub g = -2 to +4, or alternately, electron densities between 10 to the 8th power and 10 to the 14th power/cc are derived. These data are used to predict the time development of an element undergoing a cooling process. The numerical calculations are carried out for equilibrium conditions and continuous emission in an optically thin layer. However, the influences of departures from equilibrium, of line emission, and of finite optical thickness are estimated. The results are applied to a theoretical analysis of relevant flare observations. It is, in particular, shown that on the basis of the above arguments alone a position of the initial flare event in photospheric layers cannot be excluded. (Author)

AD-623 299 Div. 2/1
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
THE NATURE OF SECONDARY CRATERS PHOTOGRAPHED BY RANGER VII,
by Zdenek Kopal. Sep 65, 42p. Rept. no. D1-82-0475 ,MN-430
Unclassified report

Also available from the author.

Descriptors: (*Moon, Surface properties), (*Lunar probes, Photogeology), (*Photogeology, Lunar probes), Extraterrestrial topography, Deformation, Impact shock, Cratering, Astronomy, Spacecraft

A mathematical theory of the ejection of secondary fragments from the focus of primary impacts on the Moon has been developed for the case of a spherical bounding surface. An application of the results to the frequency - distribution of the secondary lunar craters in the region of Mare Cognitum, as determined from photographs secured by Ranger VII in July 1964, leads to a conclusion that the sum total of the mass required to produce all observed craters or crater-like formation in Mare Cognitum overlying Tycho's rays by secondary impacts of particles ejected from Tycho would - if spread evenly over the surface - cover the ground by a layer of debris about half a metre in thickness at the distance of 1000 km from the focus of ejection; and the volume of the material thus splashed out all over the Moon would exceed the volume excavated by the primary impact at least ten to twenty times. On the strength of this evidence a hypothesis is advanced that a large fraction of depressions, smaller than 1 km in size, counted as craters due to secondary impacts, are in reality subsidence formations, possibly triggered by 'moonquakes' which must occur in the wake of all major primary impacts on the Moon. (Author)

AD-623 414 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
COLORADO UNIV BOULDER
DEVELOPING A SYSTEM OF SOLAR FLARE PREDICTION.
Quarterly letter rept. for 1 Jan-31 Mar 65,
by Donald E. Billings. 31 Mar 65, 2p. Contract Nonr114713 Proj. arpa order 215
Unclassified report

Descriptors: (*Solar flares, Scientific research), Sunspots, Statistical analysis

Work was directed toward study of the intervals between flares in the same region. The objective of the study is to find evidence whether flares occur as the explosive discharge of energy that has been built up gradually, or whether they occur when statistical fluctuations in the magnetic field configurations lead to an instability. It was found, in the case of flares over simple sunspot configurations, that the frequency histogram for various intervals between flares peaks rather sharply at 80-100 minutes, whereas for more complex spot groups the peak broadens toward shorter intervals.

The results were interpreted as favoring the hypothesis of build-up and discharge. The time interval gives evidence of the rate of energy-input during the build-up period and also provides a basis for predicting the frequency of flares from an active region. (Author)

AD-623 439 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
A PHOTOMETRIC INVESTIGATION OF THE PRESENCE OF OUTER LAYERS OF VOLCANIC ORIGIN ON THE MOON,
by V. V. Sharonov. Jun 65, 16p. Rept. no. TC-917
TT , 65-64327

Unclassified report

(Fotometricheskoe Issledovanie Voprosa O Nalichii na Lune Pokrovov Vulkanicheskogo Proiskhozhdeniia) Trans. of Astronomicheskii Zhurnal (USSR) v42 n1 p136-44 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Moon, Volcanoes), (*Volcanoes, Moon), (*Astrophysics, Moon), Extraterrestrial topography, Surface properties, Optical analysis, Photometers, USSR

AD-623 472 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
STEWARD OBSERVATORY UNIV OF ARIZONA TUCSON
THE EFFECT OF LINE EMISSION UPON THE B-V COLORS OF T TAURI OBJECTS.
Final rept. of Research in Stellar Spectroscopy,
by Anthony F. Aveni, Edwin F. Carpenter, and A. B. Meinel. 1965, 25p. Contract Nonr G00045 62 Proj. NR046 792

Unclassified report

Descriptors: (*Variable stars, Line spectrum), (*Spectroscopy, Variable stars), Colors, Spectrum analyzers, Emissivity, Absorption spectrum

A method was developed to determine the influence of line omission upon the UBV colors of the T Tauri objects T Tau and RW Aur. Calibrated spectra of these objects were obtained using the Steward Observatory 36-inch telescope and the Carpenter F 0.8 nebular spectrograph. These spectra were corrected for instrumental and atmospheric effects and two colors were computed from microdensitometer traces of each spectrum: (1) thecontinuum color devoid of emission lines, and (2) the color including emission lines. The latter color can then be directly compared to the observed photometric color. Comparison of the observed R-V colors with the computed B-V shows good agreement, indicating that the photographic corrections were properly assessed. The difference of the solors obtained for the continuum, (B-V) sub c, and the continuum plus line emission, (B-V0 sub c1, shows apparent variations between Om.07 and Om 14 and T Tau and between Om 6 and Om15 for RW Aur, with some dependence upon continuum color. The line emission parameter shifts the position of both stars to the right in the log L/L sub o, log Te diagram; this can be interpreted as a correction to the contraction age of up to 20%.

AD-623 669 Div. 2/1 ,2/2
CFSTI Prices: HC $1.00 MF $0.50
MANCHESTER UNIV (ENGLAND) DEPT OF ASTRONOMY
RESEARCH INTO METHODS OF DETERMINING THE RELATIVE HEIGHTS OF PHYSIOGRAPHIC FEATURES OF THE MOON.
Final rept.,
by G. A. Mills. 29 Jan 65, 16p. Contract AF61 052 524
AFCRL , 65-431

Unclassified report

Descriptors: (*Moon, Mapping), (*Mapping, Moon), (*Astronomy, Moon), Extraterrestrial topography, Height finding, Photographic analysis, Surveying

The relative merits of two alternative methods for determining the shape of the Moon are considered. It is concluded that the terminator method is inferior to the libration method because the law of reflection of light from the surface of the Moon is not well known and cannot be ignored. (Author)

AD-623 673 Div. 2/1 ,8/6
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH GEO-ASTRO PHYSICS LAB
AURORAL ZONE RADIO STAR SCINTILLATION: MEASUREMENTS AND INTERPRETATIONS,
by John M. Lansinger. Oct 65, 44p. Rept. no. D1-82-0476

Unclassified report

Prepared for presentation at the Symposium of the AGARD Ionospheric Research Committee (10th), on 21-25 Sep 65, Rome (Italy). Also available from the author.

Descriptors: (*Extraterrestrial radio waves, Measurement), (*Radio astronomy, Atmospheric refraction), Auroral, Ionosphere, Stars, Radio interferometers, Correlation techniques, Phase modulation, Amplitude modulation, Terrestrial magnetism

A quantitative evaluation and comparison are made of angular and amplitude scintillation data received at the College, Alaska, experimental station on 68 Mc/s with a lobe-sweep interferometer. The data are reduced with an automatic data processing system. A description is presented of a phase-compensation system which allows readily interpretable measurements to be made which represent the difference between the predicted and apparent position of the radio source. A lead/lag correlation analysis is made between ionospheric absorption, magnetic variation, and the angular and amplitude scintillation data. Some results are presented which show an association between short-term absorption events and the enhancement of scintillation activity. Power spectral analysis and cross-correlation analysis are made of the experimental data. Given several ionization models, the computed ground diffraction patterns are compared with experimental data. A comparison is made between the predicted variation of scintillation depth versus zenith angle, based upon a theoretical model for field-aligned irregularities and some earlier experimental results. (Author)

AD-623 684 Div. 2/1 ,2/2
CFSTI Prices: HC $3.00 MF $0.50
MANCHESTER UNIV (ENGLAND) DEPT OF ASTRONOMY
RESEARCH INTO METHODS OF DETERMINING THE RELATIVE HEIGHTS OF PHYSIOGRAPHIC FEATURES OF THE MOON.
Final rept., app.,
by G. A. Mills. 29 Jan 65, 52p. Contract AF61 052 524
AFCRL , 65-431A

Unclassified report

See also AD-623 669.

Descriptors: (*Moon, Mapping), (*Mapping, Moon), (*Astronomy, Moon), Extraterrestrial topography, Height finding, Surveying, Photographic analysis

The method used for determining the apparent positions of objects on lunar photographis is outlined in detail. A possible scheme is suggested for combining these apparent positions to obtain absolute positions and heights of the features. A list of approximate coordinates of 960 points selected is given, together with a list of plate material available at the present time. (Author)

AD-623 252 See Fld. 8/6

AD-623 259 See Fld. 4/2

AD-623 442 See Fld. 8/2

AD-623 450 See Fld. 22

AD-623 452 See Fld. 22

AD-623 480 See Fld. 20/8

AD-623 587 See Fld. 17/8

AD-623 642 See Fld. 12/1

AD-623 651 See Fld. 5/1

AD-623 681 See Fld. 8/14

4/2. METEOROLOGY

AD-623 110 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
EMMANUEL COLL BOSTON MASS ORIENTAL SCIENCE LIBRARY
EVOLUTION OF INDIVIDUAL CUMULUS,
by Chen Jui-yung. Aug 65, 31p. Rept. no. Emm-65-1
Contract AF19 628 5073
TT , 65-64337

Unclassified report

Trans. of Ch'i Hsiang Hsueh Pao (Chinese People's Republic) v33 n2 p257-70 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Cumulus clouds, Phase studies), Meteorology, Evaporation, Moisture, Atmospheric condensation, China

In this paper, the evolution of individual cumulus is studied with basic equations involving the drag effect of water droplets and the phase transformation of moisture (including evaporation caused by entrainment). Considering individual cumulus as a uniform cloud parcel, calculations are made for the thermal conditions and other properties in the evolution process. It is shown that the drag and phase transformation effects on cloud development are important. The results are discussed and compared with observations made in China, and fair agreement is found in many aspects. (Author)

AD-623 112 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS ORIENTAL SCIENCE LIBRARY
ICE CRYSTAL FORMATION MECHANISM AND DRY ICE EVAPORATION,
by Chao Po-lin. Aug 65, 20p. Rept. no. Emm-65-2
Contract AF19 628 5073
TT , 65-64338

Unclassified report

Trans. of Ch'i Hsiang Hsueh Pao (Chinese People's Republic) v34 n1 p87-93 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Artificial precipitation, Ice),

(*Ice, Artificial precipitation), Supercooling, Clouds, Injection, Solidified gases, Carbon dioxide, Evaporation, Nucleation, Crystal growth, Meteorological phenomena, China

This paper discusses the mechanism for ice crystal formation in the neighborhood of dry ice. It studies the evaporating process of dry ice in supercooled clouds. The results agree with experiment. (Author)

AD-623 116 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.50
EMMANUEL COLL BOSTON MASS RESEARCH LANGUAGE CENTER
FORMATION AND DESTRUCTION OF THERMAL WIND IN A SIMPLE BAROCLINIC ATMOSPHERE,
by Chen Chu-shih. Aug 65, 54p. Rept. no. Emm-65-22
Contract AF19 628 3869
TT , 65-64342
Unclassified report

Trans. of Ch'i Hsiang Hsueh Pao (Chinese People's Republic), v33 n1/2 p51-63, 153-62 1963.

Descriptors: (*Wind, Thermodynamics), Atmospheric motion, Convection, Air mass analysis, Atmospheric temperature, Atmospheric models, Meteorology, China

This paper discusses the principle of vertical motion variations in the adaptation process of a thermal wind, using a simple two-layer baroclinic model. When the thermal wind vorticity in the wind field is larger than that in the temperature field, the ascending motion accelerates; otherwise, the descending motion accelerates. For the baroclinic system in the upper troposphere between 250 and 750 mb, the temperature field is adapted toward the wind field when the scale of the system is smaller than the critical scale L sub 0, and vice versa when the scale is larger than L sub 0. This is demonstrated by examples computed according to two horizontal scales, 1000 and 300 km, respectively. In the former scale, the adaptation is mainly toward the temperature field, and in the latter, toward the wind field. According to the contrast between the rates of formation and destruction of a thermal wind, the physical process of the formation of geostrophic and ageostrophic motions is described. Finally, the proposed method is applied to examine the baroclinic instability of long waves and then to clarify the vorticity mechanism of the baroclinic instability. (Author)

AD-623 117 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
EMMANUEL COLL BOSTON MASS RESEARCH LANGUAGE CENTER
A DYNAMIC MODEL FOR THE NUMERICAL PREDICTION OF BAROCLINIC FLOWS,
by Chin Tseng-hao. Aug 65, 29p. Rept. no. Emm-65-23
Contract AF19 628 3869
TT , 65-64343
Unclassified report

Trans. of Ch'i Hsiang Hsueh Pao (Chinese People's Republic), v33 n2 p131-144 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Air mass analysis, Dynamic programming), (*Weather forecasting, Mathematical prediction), (*Atmosphere models, Weather forecasting), Hydrodynamics, Thermodynamics, Meteorological parameters, Mathematical models, China

Some authors have shown that in China, the contribution to the height tendency of an isobaric surface due to surface friction is of the same order of magnitude as that of largescale topographic influences, and that under certain special weather conditions, non-adiabatic heating must be taken into account, even in short-range forecasting. Considering these effects, this paper first derives a two-parameter baroclinic model suitable for numerical weather prediction by combining the hydrodynamic and thermodynamic equations and then solves the system of prognostic equations. The truncation errors in numerical weather prediction when a triangular grid-point system is used are discussed, and an optimum formula for the field is derived. Finally, the paper discusses briefly the problem concerning the development of large-scale baroclinic disturbances. (Author)

AD-623 160 Div. 2/7 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
ROCKET INSTRUMENTATION FOR THE MEASUREMENT OF D-REGION ELECTRON DENSITY AND COLLISION FREQUENCIES.
Scientific rept.,
by T. A. Seliga, D. J. Hoffman, and J. S. Nisbet.
1 Jul 65, 25p. Rept. no. SR-244
Contract AF19 628 4050 Grant ,NsG134 61
AFCRL , 65-673
Unclassified report

See also AD-403 442.

Descriptors: (*Atmospheric sounding, Sounding rockets), (*Sounding rockets, Instrumentation), Electron density, Probes (Electromagnetic), Alternating current, Electrical conductance, Low frequency, Ionospheric propagation, Nose cones, Atmospheric temperature, Measuring devices (Electrical + electronic)

This report describes the instrumentation designed to be flown in a Black Brant II rocket, AC17.606. Three experiments are included in the design and are (1) an AC conductivity probe, (2) a low frequency propagation experiment and, (3) a temperature probe. (Author)

AD-623 175 Div. 2/3 ,2/7
CFSTI Prices: HC $4.00 MF $0.75
TEXAS A AND M UNIV COLLEGE STATION DEPT OF METEOROLOGY
RESEARCH ON TROPICAL RAINFALL PATTERNS AND ASSOCIATED MESO-SCALE SYSTEMS.
Quarterly progress rept. no. 9, 1 May-31 Jul 65,
by Walter K. Henry, John F. Griffiths, and Sidney O. Barnard. 15 Aug 65, 103p. Rept. no. Ref-65-31T
Contract DA36 039sc89202 Proj. DA1V014501B53A09 04,A and M 311
Unclassified report

Descriptors: (*Climatology, Rainfall), (*Rainfall, Tropical regions), Central America, South America, Meteorological parameters, Statistical analysis, Harmonic analysis

The coefficient of association is used as a tool to identify the meso-scale vs. the macro-scale rainfall. This tool is used across Central America and in smaller areas to determine the rainfall relationship. The areas of close relationship are small, indicating that the rainfall is from meso-scale systems along the North Coast of Honduras. A singularity in the data for October 1954 in Panama is investigated to determine its uniqueness, and its cause. An harmonic analysis of the monthly precipitation for all the long period stations in Central America has shown that an objective description of the pattern of the annual march of rainfall can be obtained. The resultant lines of equal phase angle and amplitude clearly show mesoscale rainfall regions. (Author)

AD-623 259 Div. 2/7 ,2/1 ,8/6
CFSTI Prices: HC $4.00 MF $0.75
ILLINOIS UNIV URBANA ELECTRICAL ENGINEERING RESEARCH LAB
IONOSPHERIC RESEARCH.
Quarterly progress rept. no. 7, 1 Apr-30 Jun 65,
by H. D. Webb. 30 Jun 65, 107p. Contract DA36 039AMC03703E Proj. DA3A99 20 001 04
Unclassified report

Descriptors: (*Atmospheric sounding, Magnetooptic effect), (*Ionosphere, Electron density), (*Magneto-optic effect, Atmospheric sounding), Radio waves, Ionospheric propagation, Moon, Electromagnetic wave reflections, Solar disturbances, Magnetic storms, Periodic variations, Astrophysics, Geophysics

The object of the ionospheric research is to collect data by receiving signals by reflection from the moon and measuring the Faraday Rotation; to use the data to calculate the electron content of the ionosphere above the earth; to study the diurnal, seasonal, and irregular changes in electron content; to correlate irregular changes in electron content with other natural phenomena; and to study the reflecting surface of the moon.

AD-623 334 Div. 2/7 ,5/2 ,30/2
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
THE RECORDING OF IONOSPHERIC SOUNDING DATA IN A DIGITAL FORMAT.
Technical rept.,
by Ralph Barry Lindquist. Oct 65, 50p. Rept. no. TR-15 ,RRL-290
Contract NObsr89229
Unclassified report

Master's thesis. Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Ionosphere, Atmospheric sounding), (*Atmospheric sounding, Digital recording systems), (*Telemeter systems, Atmospheric sounding), (*Digital recording systems, Telemetering data), Meteorological parameters, Data processing systems, Analog-to-digital converters, Digital computers, Feasibility studies

The data made available by ionospheric sounders is of such volume as to require digital recording and processing for efficient use of the sounders. The feasibility of implementing a system to perform the task of recording this data in a digital format is studied here. The basic problem considered is the trade-off between the accuracy of the recorded data and the volume of the recorded data. The volume of data determines the average rate of recording, therefore directly affecting the cost of implementing the system. The possibility of processing the data partly before recording is considered as is the possibility of recording the entire volume of raw data. The weight of evidence is against recording the entire volume of raw data, but rather towards a system in which more than one mode of operation is possible. These modes of operation would then allow flexibility in the use of the system for various applications. (Author)

AD-623 406 Div. 2/7 ,25/4
CFSTI Prices: HC $5.00 MF $1.00
MUNICH UNIV (WEST GERMANY) METEOROLOGISCHES INSTITUT
INVESTIGATION OF THE INFRARED EMISSION SPECTRUM OF THE ATMOSPHERE AND EARTH.
Final rept. p2,
by Hans-Juergen Bolle. 31 Jul 65, 183p. Contract AF61 052 488
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by DDC. Copy is available for public sale.

Descriptors: (*Infrared radiation, Geophysics), (*Atmosphere, Infrared radiation), (*Earth, Infrared radiation), Water vapor, Aerosols, Sky brightness, Spectroscopy

The emission of the clear sky spectrum has been

measured from 7.5 micron to 26 micron at different measuring sites, and under different meteorological conditions. The spectral resolution was approximately 2/cm. From these measurements continuum absorption coefficients have been derived for window regions in the water vapor spectrum. The emission of single lines and groups of lines which could be resolved from adjacent lines has been compared with calculated emissivities based upon theoretical line parameters. From this comparison empirical values of the product line intensity times half width could be deduced.

AD-623 409 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS STATE WATER SURVEY URBANA METEOROLOGIC LAB
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
Interim rept. no. 1, 1 Oct 64-31 Mar 65,
by A. L. Sims, E. A. Mueller, and G. E. Stout. 31 Mar 65, 29p. Contract DA28 043AMC00032E Proj. DA1V014501B53A07

Unclassified report

Descriptors: (*Weather forecasting, Meteorological radar), (*Rainfall, Radar echo areas), (*Meteorological radar, Weather forecasting), (*Radar echo areas, Rainfall), Raindrops, Radar reflections, Correlation techniques, Army research

The parameters of the log normal distribution are used to show the contributions to the rainfall rate of the number of drops, the width of the distribution, and the mode of the distribution. The progress of a statistical study of short period rainfall rates is reported. Drop break-up is investigated as an explanation for the large increase in the number of small drops for high rainfall rates in Miami. It is found to be an inadequate explanation. Some preliminary results of a study to determine an adequate sample size for drop-size studies are reported. (Author)

AD-623 461 Div. 2/7
CFSTI Prices: HC $4.00 MF $1.00
UNITED AIRCRAFT CORP EAST HARTFORD CONN
A PHYSICAL LOW-CLOUD PREDICTION MODEL.
Final rept. for Jan-Aug 65,
by Joseph P. Gerrity. Oct 65, 146p. Contract AF19 628 3437 Proj. 1 0 Task 1 2 ESD, TR-65-476

Unclassified report

Subcontracted to Travelers Research Center, Inc., Hartford, Conn., rept. no. 7463-182.

Descriptors: (*Cloud cover, Mathematical prediction), (*Weather forecasting, Mathematical models), Wind, Convection, Meteorological parameters, Boundary layer, Air mass analysis, Numerical methods + procedures, Programming (Computers)

Results of three 12-hour forecasts (for different synoptic situations), computed with the model, are presented. Equations for the contact layer were derived for the forced convection, free convection, and strong inversion regimes. The requirement for upper boundary conditions is reduced; only the geostrophic wind components and upper-level cloudiness are required from a free-air model. Empirical methods were developed for computing the instrument shelter level temperature and relative humidity. The eddy diffusion coefficient for heat and water is a function of the Richardson number throughout the boundary layer. The linear geostrophic wind shear within the boundary layer is computed from the predicted temperature. The model has not been thoroughly tested: preliminary results suggest that, given a careful analysis of routine observational data, this boundary layer model will serve operationally-meaningful diagnostic and predictive functions. The logic used in constructing the computer program for the model is presented. (Author)

AD-623 468 Div. 2/7 ,6/6 ,8/3
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS STATE WATER SURVEY URBANA ATMOSPHERIC SCIENCES SECTION
EVALUATION OF THE MASER-EQUIPPED RADAR SET AN/MPS-34 AND AREA PRECIPITATION MEASUREMENT INDICATOR.
Quarterly progress rept. no. 1, 1 Apr-30 Jun 65,
by R. E. Rinehart, and D. M. A. Jones. 30 Jun 65, 15p. Contract DA28 043AMC01257E Proj. 1V0 25001A126

Unclassified report

Descriptors: (*Masers, Meteorological radar), (*Meteorological radar, Masers), (*Atmospheric precipitation, Radar scanning), Electronics, Engineering, Installation, Operation, Maintenance, Weather forecasting, Military requirements

Problems encountered in the installation, operation, and repair of the MASER-equipped MPS-34 radar and Area Precipitation Measurement Indicator (APMI) are discussed. Both units are nearly ready for data collection. An outline is given for operations during the next quarter. (Author)

AD-623 469 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
STUDY OF PHOTOCHEMISTRY, PHYSICAL STATE AND MOTION OF THE UPPER ATMOSPHERE.
Final rept. for 1 Apr-31 Mar 65,
by Howard D. Edwards. Aug 65, 19p. Contract AF19 628 393 Proj. 7635 Task 763502 AFCRL, 65-690

Unclassified report

Descriptors: (*Atmospheric sounding, Upper atmosphere), (*Upper atmosphere, Atmospheric sounding), Sounding rockets, Ejection, Chemicals, Markers, Atmospheric motion, Photochemistry, Abstracting

The primary objectives of the contract were to gather photographic data from chemical releases which took place from rockets, and to analyze these data in terms of physical state and motion of the upper atmosphere. The data derived from the photographs have been used to determine horizontal and vertical winds, turbulence, diffusion and wind shears in the upper atmosphere. In addition to data reduction, a major portion of the contract efforts were devoted to development of equipment and the utilization of this equipment on field trips to Eglin Air Force Base, Florica and Cape Kennedy. Seven articles have been published covering the technical aspects of the work and one has been submitted for publication. Hence, this final report is essentially a compilation of abstracts from the published articles. (Author)

AD-623 471 Div. 2/7 ,8/6
CFSTI Prices: HC $4.00 MF $1.00
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
ELECTRON DENSITIES IN THE D REGION OF THE IONOSPHERE FROM LOW FREQUENCY SIGNAL STRENGTH MEASUREMENTS .IN ROCKETS.
Scientific rept. on Ionospheric Research,
by Thomas A. Seliga. 1 Nov 65, 147p. Rept. no. SR-254
Contract AF19 628 4050 Proj. 8605 Task 860502 AFCRL, 65-620

Unclassified report

Descriptors: (*Atmospheric sounding, Electron density), (*Electron density, Ionosphere), (*Ionosphere, Electron density), (*Radio waves, Ionospheric propagation), Radio fields, Intensity, Attenuation, Measurement, Sounding rockets

Techniques of determining electron densities in the D region of the ionosphere from rocket measurements of field quantities of a CW radio wave transmitted from the ground are described. Iterative methods which are based on a full wave solution of the generalized form of the differential equations governing radio wave propagation in the ionosphere are used to analyze data from two rocket flights at Ft. Churchill, Manitoba, Canada. The results of one flight (July 20, 1963) during a solar eclipse are compared with electron density profiles obtained from an impedance probe flown on the same rocket and from Langmuir probes flown in other rockets about the same time. The data from the second flight (July 26, 1963) was used to qualitatively verify the results of an impedance probe in the same rocket. The methods of analysis have also been applied to data obtained in the nighttime D region by Mechtly (1962), and the electron density profiles obtained by this analysis are presented. (Author)

AD-623 478 Div. 2/7 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
NEW YORK UNIV N Y GEOPHYSICAL SCIENCES LAB
THE PROBLEMS OF REMOTE OPTICAL PROBING OF THE ATMOSPHERE. SOME EXPERIMENTS ON THE INVERSION OF GROUND BASED RADIANCE MEASUREMENTS.
Final rept., pt. 2 on Optical Sounding II for 6 Nov 6315 Jul 65,
by E. E. Uthe. 15 Jul 65, 31p. Rept. no. 65-7 Contract DA36 039AMC03411E Proj. 1V0 14501B53A02 03

Unclassified report

Descriptors: (*Atmospheric sounding, Optical analysis), (*Lasers, Atmospheric sounding), Atmospheric temperature, Temperature inversion, Carbon dioxide, Absorption, Infrared radiation, Water vapor, Spectroscopy

Low level temperature profiles are inferred from simulated ground based atmospheric radiance measurements in the 4.3 micron CO2 band. The inversion method compares these measurements with values obtained from a radiance model which is linearized by an assumed temperature profile T degrees P. An error term is added to the radiance measurements. The solution to the unstable system of equations is determined by minimizing the sum of the squares of the departures from the linearization profile T degrees P (Twomey, 1963). An iteration method is then used to correct the radiance model. Results indicate that profiles containing a first order discontinuity give satisfactory inversions when measurement and model errors are within 2 percent accuracy. (Author)

AD-623 482 Div. 2/7 ,25/4
MUNICH UNIV (WEST GERMANY) METEOROLOGISCHES INSTITUT
ATMOSPHERIC EMISSION IN SINGLE WATER VAPOR LINES AND ITS CALCULATION BY MEANS OF RADIATION DIAGRAMS,
by H. J. Bolle. 1964, 13p.

Unclassified report

Pub. in Les Spectres Infrarouges des Astres, International Conference held at Liege Univ. 24-26 Jun 1965 p316-26 (Copies available only to DDC users).

Descriptors: (*Infrared radiation, Atmosphere), (*Atmosphere, Infrared radiation), (*Optics, Atmosphere), (*Sky brightness, Spectroscopy), Water vapor, Absorption spectrum, Line spectrum, Continuous spectrum, Emissivity

Radiation diagrams for atmospheric emission have been constructed for some single water vapor lines in the window region. The diagrams are based upon theoretical values for integrated line absorption and line width. By comparison of calculated with measured sky emissivities empirical integrat-

ed line absorptions can be derived. For this procedure the continuum background of sky emission must be accounted for. Continuum absorption coefficients have been obtained from measurements in narrow windows between water vapor lines from 8 tp 26 micron wavelength. In the 18.5 micron region the empirical integrated line absorptions came out smaller than the theoretical values, but the results are so far only based on a small number of measurements on Jungfraujoch.

AD-623 483 Div. 2/7
MUNICH UNIV (WEST GERMANY) METEOROLOGISCHES INSTITUT
STRATOSPHERIC WATER VAPOR DETERMINATION BY ABSORPTION IN SINGLE LINES,
by H. J. Bolle. 6 Sep 64, 10p.

Unclassified report

Pub. in Beitrage zur Physik der Atmosphaere (West Germany) v38 n1 p41-50 1965 (Copies available only to DDC users). Presented at the International Symposium on Radiation Processes in Leningrad, 12 Aug 64.

Descriptors: (*Stratosphere, Water vapor), (*Water vapor, Stratosphere), (*Atmospheric sounding, Satellites (Artificial)), Solar radiation, Absorption spectrum, Line spectrum, Aerosols, Atmosphere, Optical analysis

AD-623 513 Div. 2/7 ,25/4
CFSTI Prices: HC $3.00 MF $0.75
NEW YORK UNIV N Y GEOPHYSICAL SCIENCES LAB
STUDY OF ACTIVE PROBING OF WATER VAPOR PROFILES AND RESULTS OF EXPERIMENTS.
Final rept. pt. 1 on Optical Sounding II for 6 Nov 63-15 Jul 65,
by R. M. Schotland, D. Chang, and J. Bradley. 15 Jul 65, 95p. Rept. no. 65-6
Contract DA36 039AMC03411E Proj. 1V0 14501B53A02 03

Unclassified report

Descriptors: (*Lasers, Atmospheric sounding), (*Atmospheric sounding, Lasers), (*Water vapor, Atmosphere), Ruby, Optical instruments, Radar, Light transmission, Reflection, Aerosols, Spectroscopy

A ruby laser system has been assembled which includes provision for thermally tuning the laser operating wavelength. Experiments have been carried out which were designed to test the potential of such a radar for the remote determination of the vertical profile of water vapor by means of a spectral study of the back scattered energy. The results of the experiments indicate that such measurements are feasible. However, detailed information must be obtained on the water vapor absorption line structure. A theoretical study has been undertaken of the contribution of secondary molecular scattering to the return observed by a laser optical radar. The results are presented as a function of the beam width of the receiver optics and the wavelength of the laser. It is shown that the contribution of secondary scatter to the observed energy can be made negligibly small by suitably restricting the beam width of the receiver optics. (Author)

AD-623 515 Div. 2/7 ,20/3
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
THE INFLUENCE OF WEATHER ON SALT DISTRIBUTIONS AND AEROSOLS ON BEACHES,
by Robert T. Devine, Francis M. Tomnovec, Victor L. Da Gragnano, Edmond W. Jones, and William H. Buser. 14 Sep 65, 46p. Rept. no. USNRDL-TR-902
Proj. NWER A2 Task 10 066

Unclassified report

Descriptors: (*Marine meteorology, Nucleation), (*Sodium, Marine meteorology), (*Beaches, Sodium), (*Atmosphere, Sodium), California, Seacoast, Geochemistry, Transport properties, Aerosols, Salts, Atmospheric condensation, Nuclei, Air pollution, Radiological contamination, Tactical weapons, Nuclear weapons, Experimental data

The amount of sodium in the air is of interest in the fields of meteorology and agriculture in the discussion of shore phenomena as sources of condensation nuclei. Also, it is of importance in calculating the hazard due to neutron-induced radioactivity produced in the employment of tactical nuclear weapons in coastal areas. In this paper a method is described which will allow samplings of the mass loading of the atmosphere of an hour's duration while twelve hours was previously necessary. This instrument is applied in measuring the salt content above seashores as a function of sea, wind, and microseismic action. It is observed that sea and wind are indicators but that microseismic action gives the best indication of the sodium content. The distribution of exchangeable sodium on various California beaches is studied as well as the time variations of this quantity. An average profile of exchangeable sodium is reported and a means of determining the profile within an order of magnitude from weather data is described. (Author)

AD-623 532 Div. 2/7 ,23/5 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
ARACON GEOPHYSICS CO CONCORD MASS
METEOROLOGICAL SATELLITE TECHNIQUES FOR THE ARMY.
Quarterly rept. no. 1, 1 May-31 Jul 65,
by P. E. Sherr, R. J. Boucher, W. K. Widger Jr., C. W. C. Rogers, and J. C. Barnes. Aug 65, 31p.
Contract DA28 043AMC01273E Proj. 1V0 25001A126 01 16
ECOM , 01273-1

Unclassified report

Descriptors: (*Meteorological satellites, Army research), (*Weather forecasting, Military requirements), Military personnel, Training, Meteorology, Handbooks

The research reported herein was conducted during the first quarter of a contractual investigation aimed at providing the Army field units with techniques for the use of weather satellite data. Results to date for each of several tasks are discussed. These include: (1) mesoscale analysis and interpretation studies; (2) analysis of Army requirements for applications of weather satellite data; (3) case studies of World War II, Korean or U. S. field maneuver synoptic situations, using analogs for which satellite data are available; (4) investigations of methods for determining weather affecting enemy operations; and (5) handbook preparation. Examples of the type of analyses being prepared for the tasks concerned with mesoscale studies, case studies, and weather affecting enemy operations are presented and discussed. No attempt has been made to draw final conclusions from the early stages of the investigations. However, certain areas which seem to hold particular promise have been noted. For example, the simple relationship of total cloud cover (as observed by the satellite once per day) to amount of precipitation over a selected geographical area seems to show a high correlation. (Author)

AD-623 582 Div. 2/7 ,6/3 ,30/3
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
PROJECT TBIRD.
Final data rept. for May 61-Oct 63,
by Frank B. St. Nov 65, 68p. Rept. no. NOTS-TP-3651
Proj. 61SSD35 Task 79750
NAVWEPS , 8622

Unclassified report

Descriptors: (*Infrared spectroscopy, Sounding rockets), (*Sounding rockets, Infrared optical systems), Payload, Clouds, Radiometers, Infrared radiation, Infrared detectors, Background, Photographs

Rocket probe experiments designed to measure and map apparent spectral radiance of terrestrial highaltitude clouds from space (83 kilometers peak altitude) are reported. Measurement technique, experimental design and quantitative infrared data in five narrow regions of the spectrum from 1.9 to 6.7 microns are presented. Terrestrial spectral radiance maps obtained at 2.2, 2.7, 4.3, and 6.7 microns and typical radiance contour maps are also presented. (Author)

AD-623 598 Div. 2/7 ,2/6
CFSTI Prices: HC $2.00 MF $0.50
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF PHYSICS
PARTICLE HEATING EFFECTS IN THE UPPER F REGION.
Technical rept.,
by K. V. S. K. Nathan. 1964, 36p. Contract N62558 4155

Unclassified report

Descriptors: (*Ionosphere, Thermal radiation), (*Electron bombardment, Ionosphere), Electron density, Diurnal variations, Transport properties, Particle trajectories, Diffusion, Heat transfer, Terrestrial magnetism, Upper atmosphere

Night time electron temperatures in the upper atmosphere obtained from the satellite Ariel I indicate an energy input to the ionosphere that is corpuscular in orgin. Willmore (1964) infers an energy flux of 40 ergs per sq-cm by electron volts. But estimates of energy flux based on observations on the intensity of the spectral bands of nitrogen, and neglecting all effects due to the magnetic field, suggest an energy flux two to three orders of magnitude smaller. A Fokker-Planck type diffusion equation is used to investigate the steady state flux densities built up in the upper atmosphere by a constant source of electrons subject to scattering and energy degradation processes. It is found that, when magnetic field effects are allowed for, it is possible to reconcile the energy flux inferred from the ionospheric heating effects with the much smaller flux suggested by optical emission. (Author)

AD-623 603 Div. 2/7 ,12/5 ,6/6
LINCOLN LAB MASS INST OF TECH LEXINGTON
A COMPARISON OF ROCKET, SATELLITE, AND RADAR DETERMINATIONS OF ELECTRON TEMPERATURE AT MIDLATITUDES,
by J. V. Evans. 31 Mar 65, 10p.

Unclassified report

Pub. in Journal of Geophysical Research v70 n17 p4365-74 Sep 1 1965 (Copies not available to DDC or Clearinghouse customers). Research supported by U. S. Air Force.

Descriptors: (*Ionosphere, Temperature), (*Electrons, Temperature), Electron density, Periodic variations, Diurnal variations, Sounding rockets, Radar signals, Meteorological satellites

The three principal methods of determining the electron temperature T at ionosphere F-region heights are briefly reviewed and their relative merits discussed. Satellite observations suffer because of the difficulty in separately determining time and height dependencies, and rockets cannot be launched on a scale required to follow diurnal and seasonal changes. The radar backscatter technique has none of these disadvantages, but, in the case of the Millstone Hill radar, suffers from poor height resolution and difficulties arising in the interpretation of some of the observations. Results reported for the year 1963 from (a) rocket soundings from Wallops Island, Virginia, (b) the satellite Explorer 17, and (c) ionospheric backscatter observations from Millstone Hill, Westford, Massachusetts, are compared. There is only fair agree-

ment between the height dependence of T obtained by the backscatter and rocket techniques, but there is good agreement between the satellite and backscatter results for T at a fixed altitude. All three techniques indicate that at midlatitudes the electron temperature exceeds the ion temperature both by day and by night. The backscatter results would be consistent with the amount of heat expected to arise from the cooling of the protonosphere. (Author)

AD-623 606 Div. 2/7 ,25/3
LINCOLN LAB MASS INST OF TECH LEXINGTON
CAUSE OF THE MIDLATITUDE WINTER NIGHT INCREASE IN FOF2.
Revised ed.,
by J. V. Evans. 7 Jun 65, 15p.
Unclassified report

Pub. in Journal of Geophysical Research v70 n17 p433145 Sep 1 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 31 Mar 65.

Descriptors: (*Ionosphere, Plasma oscillations), (*Diurnal variations, Ionosphere), Electron density, Electrons, Ions, Temperature, Ionization, Heat transfer, Exosphere, Radar signals

Electron density measurements and determinations of the electron and ion temperatures throughout the F region have been made at midlatitudes by the incoherent backscatter technique at Millstone Hill. Results of this work are presented for the hours 1800-0600 EST for the months November and December 1963 and January 1964. The early morning increase in foF2 observable at this station near 0200-0400 EST in these months is accompanied by density increases at all the other altitudes that could be investigated, i.e., up to 600 km. Hence this phenomenon cannot be accounted for by changes only in the shape of the layer. Further, the electron and ion temperatures tended to decrease as the density increased, indicating that freshly produced ionization caused, for example, by particle precipitation cannot be invoked as an explanation. It is concluded that additional ionization must have diffused from great altitudes in the exosphere. It is suggested that this downward motion may occur at this time as a result of a lowering of the exospheric electron temperature after sunset in the southern (summer) hemisphere. (Author)

AD-623 662 Div. 2/7
CFSTI Prices: HC $4.00 MF $0.75
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF METEOROLOGY
NUMERICAL STUDIES OF PLANETARY CIRCULATIONS IN A MODEL ATMOSPHERE.
Final rept.,
by A. Huss. Aug 65, 120p. Contract AF EOAR76 64
AFCRL, 65-771
Unclassified report

Descriptors: (*Atmospheric motion, Atmosphere models), (*Atmosphere models, Numerical analysis), Heat transfer, Friction, Integration, Vortices, Water vapor, Humidity, Thermodynamics, Weather forecasting

The evolution of general circulation patterns has been studied by means of a two-level quasi-geostrophic model incorporating diabatic heating and surface friction. An attempt was made to introduce water vapor into the model atmosphere, and to study the resulting patterns of evaporation and precipitation. (Author)

AD-623 663 Div. 2/7
CFSTI Prices: HC $5.00 MF $1.00
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF METEOROLOGY
RESEARCH ON CHARACTERISTICS AND EFFECTS OF SEVERE STORMS.
Annual summary rept. no. 1,
by T. N. Carlson, F. H. Ludlam, J. S. A. Green, and J. F. R. McIlveen. Aug 65, 170p. Contract AF EOAR64-60
AFCRL, 65-770
Unclassified report

Descriptors: (*Storms, Air mass analysis), (*Air mass analysis, Storms), Atmospheric motion, Meteorological parameters, Hail, Tornadoes, Thunderstorms, Weather forecasting

In the first part of this report an examination is made of the large-scale conditions under which severe local storms develop. Detailed case-studies have been made in respect of six situations, five of which are described here. In two of these, over Western Europe, severe hailstorms occurred, one with tornadoes, and in another storms failed to develop. In the other two situations, tornadic hailstorms developed over and near the state of Oklahoma. It is concluded that the occurrence of the most intense storms depends upon a favourable combination of geographical and large-scale atmospheric flow features. In the several case studies the technique of analysis used isentropic charts showing the flow relative to a large-scale motion system, assumed to be in a steady state. In the second part of the report this technique is discussed and shown to have some advantages over conventional methods, sufficient to justify its further examination. (Author)

AD-623 667 Div. 2/7
CFSTI Prices: HC $4.00 MF $0.75
UNIVERSITY COLL OF WALES ABERYSTWYTH DEPT OF APPLIED MATHEMATICS
LARGE SCALE MOVEMENTS OF THE ATMOSPHERE.
Final scientific rept.,
by T. V. Davies, D. W. Beard, and Kaye R. James. 30 Jun 65, 112p. Contract AF61 052 690
AFCRL, 65-775
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Atmospheric tides, Ozone), (*Ozone, Atmospheric tides), Atmospheric motion, Hydrodynamics, Solar radiation, Absorption, Heat transfer

The broad aim of the paper is to attempt to understand the dynamical response of the atmosphere, in its tidal movements, to variations in ozone content.

AD-623 682 Div. 2/7 ,30/3
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS METEOROLOGY LAB
MEASUREMENT TECHNIQUES IN CLOUDS.
Physical sciences research papers,
by D. R. Fitzgerald. Sep 65, 24p. Rept. no. PSRP-139
Proj. 8620 Task 862001
AFCRL, 65-701
Unclassified report

Pub. in Problems of Atmospheric and Space Electricity (S3) n3 p199-212 1965 (Copies available only to DDC users).

Descriptors: (*Atmospheric sounding, Clouds), (*Clouds, Atmospheric sounding), Meteorological parameters, Atmospheric electricity, Airborne, Measuring devices (Electrical + electronics), Meteorological balloons, Airplanes

The technical problems involved in aircraft measurements of air conductivity, space charge, and electric fields are reviewed. Conductivity measurements require that particles do not strike the sensitive electrode and that electric fields in the vicinity of the air intake do not disturb the ambient ion populations. Space charge measurements are particularly required for the large ion and cloud droplet densities and for the precipitation charges. Substantial progress has been made with induction ring techniques for the precipitation charge. A great deal of work remains to be done on instrumentation for reliable droplet and large ion measurements. Electric field measurements can be accomplished with radioactive probes or field meters of the induction type. Illustrations of the performance of field meters in and around large clouds are given and the necessity of separating the aircraft charge field from the external field is stressed. (Author)

AD-623 191 **See Fld. 14/2**

AD-623 225 **See Fld. 8/10**

AD-623 240 **See Fld. 8/14**

AD-623 330 **See Fld. 20/4**

AD-623 580 **See Fld. 20/14**

AD-623 620 **See Fld. 20/3**

AD-623 643 **See Fld. 17/9**

AD-623 646 **See Fld. 20/14**

AD-623 647 **See Fld. 20/14**

5/1. ADMINISTRATION AND MANAGEMENT

AD-623 105 Div. 26/2
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
COST-EFFECTIVENESS ANALYSIS: AN APPRECIATION,
by E. S. Quade. Oct 65, 7p. Rept. no. P-3248
Unclassified report

Descriptors: (*Costs, Effectiveness), Decision making, National defense, Reliability, Analysis, Quality control, Armed forces budgets

The paper attempts to clarify the nature and scope of cost-effectiveness analysis and to point out its proper role as an aid to decisionmaking. It discusses, in the context of national security problems, the reliability and limitations of such analyses and ways to improve its quality. (Author)

AD-623 258 Div. 30/1 ,26/2 ,18/3
CFSTI Prices: HC $3.00 MF $0.75
ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS) WASHINGTON D C
DEPARTMENT OF DEFENSE GUIDE TO THE EVALUATION OF THE PERFORMANCE OF MAJOR DEVELOPMENT CONTRACTORS.
Aug 65, 62p.
AD ,PB 615 844 superseded; ,181 549 rev.
Unclassified report

Descriptors: (*Department of Defense, Research program administration), (*Research program administration, Department of Defense), Handbooks, Reports, Costs, Standards, Scheduling, Management engineering

The purpose of the Defense Program of Contractor Performance Evaluation is to provide an orderly and uniform method of determining and record-

ing the effectiveness of contractors in meeting their contractual commitments under contracts for advanced development, engineering development and operational-systems development. The existence of this procedure will increase the importance to the contractor of satisfying his agreements in regard to cost, schedule and technical performance. The Program provides a long-term incentive to contractors by creating within the government a 'memory' of their performance and a means for considering his record in future actions relating to source selection. (Author)

AD-623 275 Div. 26/2 ,18/3
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SOME SOURCES OF UNCERTAINTY IN ENGINEERING DESIGN PROJECTS,
by H. B. Eyring. Oct 65, 47p. Rept. no. RM-4503-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.

Descriptors: (*Management engineering, Design), (*Probability, Management planning), (*Weapon systems, Air-to-air), Engineering, Combinatorial analysis, Systems engineering, Decision theory, Air force equipment

A study, based on interviews and observations of engineering projects, describing how first level technical supervisors perceive causes of uncertainty in their design work. Sources of uncertainty are defined as factors (including interpersonal relations), which might cause group leaders to see more than one solution to problems in design. Two primary sources of uncertainty are: (1) unknown problem difficulty and (2) possible changes in specifications defining the problem. The author concludes that while his findings are tentative, they do question some current practices in obtaining information about uncertainty. (Author)

AD-623 462 Div. 30/1 ,18/1 ,18/7 ,32/4 ,+
CFSTI Prices: HC $4.00 MF $0.75
RAND CORP SANTA MONICA CALIF
SELECTED RAND ABSTRACTS , VOLUME 3, ABSTRACTS 1808-2274, JANUARY-SEPTEMBER 1965.
Sep 65, 112p.
Unclassified report

See also AD-616 844.

Descriptors: (*Military strategy, Abstracting), (*Air force research, Abstracting), (*Scientific research, Abstracting), (*Abstracting, Air force research), (*Political science, Abstracting), Subject indexing, Indexes, Systems engineering, Economics, Foreign policy, Strategic warfare, Defense systems, Air Force, Reports

Contents: Science, technology and methodology; Systems applications; Economics and foreign affairs; Defense policy and strategy; General and miscellaneous.

AD-623 518 Div. 26/2 ,26/3 ,15/1
CFSTI Prices: HC $4.00 MF $0.75
CORNELL UNIV ITHACA N Y DEPT OF INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH
CONSTRAINED OPTIMIZATION OF LINEAR SYSTEMS FOR INFINITE HORIZON PROBLEMS.
Technical rept.,
by Charles Roger Glassey. Aug 65, 112p. Rept. no. TR-1
Contract Nonr40155 Proj. NR047 055
Unclassified report

Descriptors: (*Optimization, Linear systems), (*Inventory control, Optimization), (*Production control, Optimization), Dynamic programming, Management planning, Operations research

Some methods of optimal control theory are extended with a view toward applications to production and inventory control. A linear, discrete time, deterministic system with vector state and decision variables is optimized relative to a quadratic criterion. The optimal control is shown to be piecewise linear in the state vector when the decision is constrained to be nonnegative, and an algorithm is presented for computing optimal controls. The following results are obtained for the infinite horizon unconstrained problem with no discounting of future costs: (1) necessary conditions for convergence of optimal N-period policies. (2) optimal properties of this limit policy. These results are applied to modify the finite horizon algorithm to obtain optimal controls for the infinite horizon constrained problem. Results of some computations are presented. (Author)

AD-623 519 Div. 26/2 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
CORNELL UNIV ITHACA N Y DEPT OF INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH
AN ALLOCATION MODEL AND ITS APPLICATION TO A MULTI-ECHELON INVENTORY PROBLEM.
Technical rept.,
by D. L. Iglehart, and A. P. Lalchandani. Sep 65, 44p. Rept. no. TR-2
Contract Nonr 40155 Proj. NR047 055
Unclassified report

Descriptors: (*Stock level control, Optimization), (*Inventory analysis, Stock level control), Scheduling, Dynamic programming, Operations research, Management planning

The problem of optimal allocation of stock to two inventory installations is studied under the condition that the sum of the two inventories is less than a fixed level. For the n-period dynamic problem optimal policies are obtained when the ordering cost is linear and the oneperiod expected holding and shortage costs are convex. Extensions are given to the cases of time lags in delivery of stock and incomplete backlogging of excess demand. The infinite horizon problems are considered for the discount factor alpha less than or = 1. Finally, applications of this allocation model to multi-echelon and multi-product inventory problems are given. (Author)

AD-623 630 Div. 30/1
CFSTI Prices: HC $5.00 MF $1.25
NAVAL AIR ENGINEERING CENTER PHILADELPHIA PA
FOUNDATIONAL RESEARCH PROGRAM,
by A. H. Clancy,Jr.. 1965, 196p.
Unclassified report

Descriptors: (*Naval research, Scientific research), Reports, Fluid mechanics, Lubrication, Fracture (Mechanics), Metals, Aircraft seats, Corrosion, Performance (Human), Masers, Test vehicles, Jet engine noise, Plastic coatings, Fractorgraphy, Metalbolism, Radiation damage, Films, Neutron activation, Textiles, Catapults, Launching, Guided missiles, Hydrogen embrittlement

AD-623 651 Div. 30/1 ,8/3 ,8/1 ,8/2 ,+
CFSTI Prices: HC $3.00 MF $0.75
LINCOLN LAB MASS INST OF TECH LEXINGTON
GENERAL RESEARCH.
Quarterly technical rept. for 1 May-31 Jul 65,
by Frederick C. Frick, Jerome Freedman, Harry C. Gatos, Stephen H. Dodd, and John F. Hutzenlaub. 15 Aug 65, 59p. Contract AF19 628 5167 Proj. 649L
ESD , TDR-65-316
Unclassified report

Descriptors: (*Data processing systems, Scientific research), (*Radar, Scientific research), (*Radio communication systems, Scientific research), (*Solid state physics, Scientific research), Radio astronomy, Circuits, Digital computers, Films, Magnetic materials, Computer storage devices, Thin films (Storage devices), Behavior, Reconnaissance satellites, Meteorological satellites, Radio astronomy, Radar antennas, Electric filters, Amplifiers, Solid state physics, Lasers

The summary consolidates the reports of Division 2 (Data Systems), Division 3 (Radio Physics), Division 4 (Radar), Division 7 (Engineering), and Division 8 (Solid State) on the General Research Program at Lincoln Laboratory. (Author)

AD-623 283 See Fld. 15/5

5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-623 162 Div. 32/3 ,30/2
CFSTI Prices: HC $5.00 MF $1.00
APPLIED MECHANICS REVIEWS SAN ANTONIO TEX
WADEX WORD AND AUTHOR INDEX. PART I. DESCRIPTION. PART II. PROGRAM DOCUMENTATION,
by E. A. Ripperger, HaroldWooster, Stephen Juhasz, and David Falconer. Jun 65, 193p. Rept. no. AMR-38
Contract AF AFOSR33 64 Proj. 9769 Task 976901
AFOSR , 65-2001
Unclassified report

Prepared in cooperation with Southwest Research Inst., San Antonio, Tex., and American Society of Mechanical Engineers, New York. See also AD-621 209.

Descriptors: (*Indexes, Automation), (*Programming (Computers), Indexes), Subject indexing, Periodicals

AD-623 495 Div. 32/3, 30/2
ARIZONA UNIV TUCSON
DOCUMENT ASSOCIATION AND CLASSIFICATION BASED ON L-LANGUAGES,
by Jerry Sanders. Jan 64, 7p. Contract AF AFOSR62 289 Proj. 9769 Task 976901
AFOSR , 65-1589
Unclassified report

Pub. in Journal of the Association for Computing Machinery v12 n2 p249-53 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Reports, Classification), (*Computers, Classification), (*Documentation, Classification), Information retrieval, Theory, Language, Word association, Mathematical logic

Measures of document connectedness and association are defined whose nature arises from the internal structure of the documents themselves rather than via the judgment of an external observer. The intent is to develop the theoretical structure in such a way that the processing of documents into the various classifications can be done entirely by machine. The theory is founded on a set of formal languages, the L-languages. A formal presentation of the theory is made and examples of five documents are given and discussed. The implications of the theory for automated document retrieval are discussed in conjunction with various extensions of the formal theory. (Author)

AD-623 537 Div. 32/3
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C DIRECTORATE OF INFORMATION SCIENCES
SOME OBSERVATIONS ON INSDOC SERVICES,
by Harold Wooster. 1965, 10p.
AFOSR , 65-1979
Unclassified report

Pub. in IASLIC Bulletin v10 n1 p1-10 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Libraries, Documentation), (*Documentation, Information retrieval), Periodicals, Indexes, Abstracting, Classification, Bibliographies, Scientific research, Reports, Storage, India

INSDOC established under UNESCO sponsorship in 1952 has the following functions: To receive and retain all scientific periodicals which may be of use to the country; To inform scientists and engineers of articles which may be of value to them by issuing a monthly bulletin of index or abstracts; To answer specific enquiries from information available only in the Centre; To supply photocopies or translations of articles required by individual workers; To be a national depository for reports of the scientific work of the nation, both published and unpublished; To be a channel through which the scientific work of India is made known and available to the rest of the world.

AD-623 590 Div. 32/3 ,30/2
CFSTI Prices: HC $4.00 MF $1.00
HRB-SINGER INC STATE COLLEGE PA
AN INFORMATION RETRIEVAL SYSTEM MODEL,
by Charles R. Blunt. Oct 65, 144p. Rept. no. 352.14-R-1
Contract Nonr381800

Unclassified report

Descriptors: (*Information retrieval, Simulation), (*Data storage systems, Information retrieval), Models (Simulations), Data processing systems, Programming (Computers), Computer logic, Effectiveness, Costs

The report presents some work pertinent to the quantitative evaluation of information retrieval (IR) systems and extends the development of an Information Retrieval System Simulation Model. The present IR system simulation examines system response time, equipment/personnel utilization and idle time, and delay time in queue. The general IR model is, essentially, an ordered grouping of basic retrieval functions. The nature of the functions and the configuration of the system can be specified to the simulation program by the investigating engineer. The simulation program can ultimately be used by Naval planners of information retrieval systems to evaluate alternative IR configurations, to identify and illustrate the need for an IR system, and to assess the effectiveness of such a configuration. Response time of an IR system is cited as one necessary criterion of system performance and is closely related to the operating costs, another quantitative measurement of an IR system. (Author)

AD-623 627 Div. 32/3
MASSACHUSETTS INST OF TECH CAMBRIDGE
COMPARISON OF THE RESULTS OF BIBLIOGRAPHIC COUPLING AND ANALYTIC SUBJECT INDEXING,
by M. M. Kessler. 1965, 11p.

Unclassified report

Pub. in American Documentation v16 n3 p223-33 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Supported in part by National Science Foundation and Office of Naval Research. See also AD-278 266 and PB-163 058.

Descriptors: (*Subject analysis, Statistical analysis), (*Reports, Analysis), Periodicals, Correlation techniques, Information retrieval, Bibliographies

A detailed comparison of how 334 papers in Vol. 112 of Physical Review form related groups according to two criteria of relatedness. The criteria are: (1) the Analytic Subject Index as used by the editors of the Physical Review; and (2) the method of Bibliographic Coupling. The similarities and differences between the groups thus formed are illustrated and discussed. (Author)

AD-623 506 See Fld. 11/12

AD-623 619 See Fld. 5/10

5/3. ECONOMICS

AD-623 394 Div. 32/4 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
ON STATISTICAL COST ANALYSIS AND OPERATION RESEARCH.
Management Sciences research rept.,
by Charles H. Kriebel. Aug 65, 31p. Rept. no. MSRR-50
Contract Nonr76024 Proj. NR047 048

Unclassified report

Descriptors: (*Costs, Statistical analysis), (*Operations research, Costs), (*Quadratic programming, Costs), Economics, Linear programming, Decision theory, Management engineering

Although the operations research or management scientist is both a theoretician and an empiricist, the literature on data analysis problems in operations research is relatively sparse. This report discusses a variety of empirical problems in obtaining statistical estimates of operating costs for a quadratic programming model and presents a case history. (Author)

AD-623 552 Div. 32/4
CFSTI Prices: HC $3.00 MF $0.50
RAND CORP SANTA MONICA CALIF
QUASI-CORES IN A MONETARY ECONOMY WITH NONCONVEX PREFERENCES,
by L. S. Shapley, and Martin Shubik. Oct 65, 51p. Rept. no. RM-3518-1-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Economics, Game theory), (*Game theory, Economics), Money, Commerce, Bargaining

A model of a pure exchange economy is investigated without the usual assumption of convex preference sets for the participating traders. The concept of core, taken from the theory of games, is applied to show that if there are sufficiently many participants, the economy as a whole will possess a solution that is sociologically stable--i.e., that cannot profitably be upset by any coalition of traders. (Author)

AD-623 672 Div. 32/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
MICHAEL KASER, COMECON: INTEGRATION PROBLEMS OF THE PLANNED ECONOMIES, LONDON, NEW YORK, TORONTO: OXFORD UNIVERSITY PRESS, 1965, PAGES VII, 215,
by Oleg Hoeffding. Nov 65, 4p. Rept. no. P-3265

Unclassified report

Descriptors: (*Economics, Eastern Europe), (*Eastern Europe, Economics), (*USSR, Economics), Rumania

Book review prepared for publication in the 'Slavic Review.' The first part of the book deals with the origins and history to mid-1964 of the Council of Mutual Economic Assistance (or CMEA, or Comecon). The second part discusses CMEA's achievements and prospects. CMEA has been in existence for 16 years. The book benefits greatly from Mr Kaser's service during 1951-1963 with the United Nations Economic Commission for Europe.

AD-623 462 See Fld. 5/1

5/4. HISTORY, LAW AND POLITICAL SCIENCE

AD-623 462 See Fld. 5/1

5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

AD-623 304 Div. 23/4 ,18/1
CFSTI Prices: HC $4.00 MF $0.75
HRB-SINGER INC STATE COLLEGE PA
HIGHER EDUCATION AND THE POST-ATTACK PERIOD.
Final rept.,
by Robert B. King,Jr., Anna M. Kleiner, and William O. Hambacher. Aug 65, 111p. Rept. no. 79511-F
Contract OCD PS64 48

Unclassified report

Descriptors: (*Education, Nuclear warfare), (*Nuclear warfare, Education), Civil defense systems, Universities, Urban areas, Nuclear explosion damage, Nuclear warfare casualties, Survival, Vulnerability, Students, Instructors, Professional personnel, Sociology, United States, Tables, Graphics

The report presents an investigation into the post-nuclear attack capabilities of the institution of higher education. It provides a methodology for institutional analysis employable in the study of a wide range of social institutions. The existing higher education system was assessed from the standpoint of physical and organizational vulnerabilities, and the nature of system disruption likely to occur as a result of the vulnerabilities was disclosed. Operational elasticity was examined and found to be an important factor in the assessment of potential post-attack capability. (Author)

AD-623 385 Div. 23/5
CFSTI Prices: HC $4.00 MF $0.75
NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y
INTRODUCTORY COURSE ON TRAINING SITUATION ANALYSIS PROCEDURE.
Technical rept.,
by M. A. Bertin. Aug 65, 119p. Rept. no. navtradevcen-IH-37

Unclassified report

Descriptors: (*Military training, Symposia), (*Education, Military training), Operations research, History, Analysis, Naval training, Costs, Psychometrics

Contents: The TSA Council; The nature of operations research; The TSA, history and background; Training analysis procedure; Marine tactical data system application; Training analysis method; Interviewing techniques; Cost pricing.

AD-623 393 Div. 23/1 ,15/1
CFSTI Prices: HC $3.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
MODELS AND MODELLING FOR MANPOWER PLANNING.
Management Sciences research rept.,
by W. R. Dill, D. P. Gaver, and W. L. Weber.
Sep 65, 56p. Rept. no. MSRR-51
Contract Nonr76024 Proj. NR047 048

Unclassified report

Descriptors: (*Manpower studies, Management planning), (*Personnel management, Mathematical models), Statistical processes, Stochastic processes, Probability, Mathematical prediction, Simulation

The paper reviews some earlier quantitative work in personnel flow and manpower planning. It describes the necessity and uses for models, and the means for their development and manipulation. It proposes models for several idealized hierarchical situations, and deduces data requirements and implications. Simulation and new problems are both treated. (Author)

AD-623 526 Div. 23/4 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
THE USES OF PLATO: A COMPUTER-CONTROLLED TEACHING SYSTEM,
by Donald L. Bitzer, Elizabeth R. Lyman, and J. A. Easley Jr.. Oct 65, 35p. Rept. no. R-268
Contract DA28 043AMC00073E ,Nonr398508
Proj. 20014501B31F

Unclassified report

Descriptors: (*Teaching machines, Digital computers), Decision making, Students, Compilers, Television display systems, Education, Programming (Computers), Automatic, Learning

The use of a high-speed digital computer as a central control element provides great flexibility in an automatic teaching system. Using a computer-based system permits versatility in teaching logics since changing the type of teacher merely requires changing the computer program, not the hardware. In addition, having access to the decision-making capacity of a large computer located as one unit permits complicated decisions to be made for each student. Such capacity would be prohibitively expensive to provide by means of decisionmaking equipment located at each student station. The results of exploratory queuing studies show that the system could teach as many as a thousand students simultaneously without incurring a noticeable delay for any student's request. The educational results thus far have been extremely encouraging. However, reliable conclusions on educational achievement must await the results of more thorough experiments now in progress which include larger numbers of students learning under a variety of conditions. The adaptability and useability of the system for a variety of purposes in education and the behavioral and physical sciences have been clearly demonstrated. (Author)

AD-623 529 Div. 23/1 ,28/2
CFSTI Prices: HC $6.00 MF $1.25
PURDUE UNIV LAFAYETTE IND
A COMPARISON OF RECOGNITION AND RECALL METHODS OF OBTAINING JOB INFORMATION.
Doctoral thesis,
by Joseph Edward Zuro. Aug 65, 219p. Contract AF41 609 1604

Unclassified report

Descriptors: (*Job analysis, Air force personnel), Officer personnel, Supervisory personnel, Recall, Memory, Manpower studies, Personnel management, Sampling, Statistical analysis, Correlation techniques

The study was designed to determine whether there are significant differences in quantity and quality of job information obtained by recognition and recall methods of job analysis, as represented by two checklist inventories and an open-end questionnaire. A secondary purpose was to determine whether there are significant differences in the job information obtained by two checklist inventories which differ in the source of the data used in their construction. One, designated a recall source inventory, was prepared from recall information submitted by job incumbents. The other instrument, designated a recognition source inventory, was constructed by subject matter-experts. From a population of 575 jobs whose incumbents had completed the three survey instruments, a stratified sample of 22 jobs was selected.

AD-623 396 **See Fld. 17/7**

AD-623 532 **See Fld. 4/2**

5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-623 104 Div. 28/5 ,28/4
CFSTI Prices: HC $3.00 MF $0.75
TEXAS CHRISTIAN UNIV FORT WORTH INST OF BEHAVIORAL RESEARCH
DIMENSIONS OF ORGANIZATIONAL STRUCTURE. A FACTOR-ANALYTIC REEVALUATION OF THE HEMPHILL GROUP DIMENSIONS DESCRIPTION QUESTIONNAIRE.
Technical rept.,
by S. B. Sells, and Nurhan Findikyan. Nov 65, 62p. Rept. no. TR-7
Contract Nonr342600

Unclassified report

Descriptors: (*Social psychology, Psychometrics), (*Test construction (Psychology), Behavior), (*Group dynamics, Psychometrics), Motivation, Scale, Factor analysis, Students, Correlation techniques

The Hemphill questionnaire was administered to 967 students in order to test the factor structure of the thirteen Hemphill dimensions. The report discusses 25 factors, as revealed by the Hemphill test results, related to group organizational structure.

AD-623 119 Div. 28/5
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
TRAINING FOR GROUP INTERDEPENDENCE.
Final rept.,
by Donald B. Haines. Jul 65, 27p. Rept. no. AMRL-TR-65-117
Proj. 1710 Task 171008

Unclassified report

Descriptors: (*Group dynamics, Training), Social psychology, Military training, Learning, Behavior, Game theory, Stress (Psychology), Counterinsurgency, Culture

Small teams and crews working together in intimate coordination are the key to many USAF missions today and effective team performance may depend upon member interdependency within the group. An adequate training program requires understanding of the ways in which men work together in closely-knit groups. Goal and means interdependency in group process has long been a focus of interest for social psychologists. Current research and theory thus may provide useful guidelines for applications of group interdependency principles to military crew situations (particularly that of the American military advisor working with his foreign counterpart). The concepts of goal and means interdependency are defined, the controversy between current exponents of cognitive and stimulus-response (S-R) theory is examined for its contribution to understanding group interdependency phenomena, the recent adaptation of the theory of games is reviewed, and suggestions are made for the development of experimental training programs which will furnish insights into the nature of group functioning. (Author)

AD-623 135 Div. 28/5 ,18/4
CFSTI Prices: HC $3.00 MF $0.75
APPLIED PSYCHOLOGICAL SERVICES WAYNE PA
COMMUNICATIONS AS A MEASURABLE INDEX OF TEAM BEHAVIOR.
Final rept.,
by Philip Federman, and Arthur I. Siegel. Oct 65, 90p. Contract N61339 1537 Proj. 7666 1
NTDC,PW , 1537-1

Unclassified report

Descriptors: (*Group dynamics, Antisubmarine warfare), (*Antisubmarine aircraft, Communication systems), Helicopters, Performance (Human), Behavior, Leadership, Training, Training devices, Aviation personnel, Flight simulators, Decision making, Factor analysis, Analysis of variance, Applied psychology

The relationship between anti-submarine (ASW) helicopter team performance and the content and flow of communications within the team during a simulated attack was investigated. Fourteen distinct communications variables were found to be correlated with the objective performance measurement criterion (miss distance) employed. The factors were named 'probabilistic structure,' 'evaluative interchange,' 'hypothesis formulation,' and 'leadership control.' The findings of this study suggest the value of developing scaled performance measures as diagnostic devices for evaluating inflight crew behavior, as predictors of success in the Fleet, and as end-ofcourse measures. The implications of the findings for training devices and training device problems are developed. (Author)

AD-623 147 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
SUPPLEMENTARY REPORT: ASSOCIATIVE ASYMMETRY AS A FUNCTION OF PRONUNCIABILITY.
Technical rept.,
by Clifton W. Gray, and Slater E. Newman. Jun 65, 4p. Rept. no. TR-13
Contract Nonr48608

Unclassified report

Prepared in cooperation with Norwich State Hospital, Conn.

Descriptors: (*Verbal behavior, Learning), (*Learning, Verbal behavior), (*Recall, Training), Performance tests, Analysis of variance

(S-R - (R-S) and (R-term) - (S-term) asymmetry were found not strongly related to pronunciability of S-R pairs. (Author)

AD-623 148 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
SERIAL POSITION AS A CUE IN LEARNING: EFFECTS OF PAIRING-AND TEST-ORDERS.
Technical rept.,
by Harold J. Tragash, and Slater E. Newman. Jun 65, 5p. Rept. no. TR-14
Contract Nonr48608

Unclassified report

Descriptors: (*Learning, Performance tests), (*Training, Effectiveness), Analysis of variance, Performance (Human), Psychometrics

Presenting paired associates in the same serial order on all pairing and test trials facilitated performance during training but not learning of the pairs. (Author)

AD-623 149 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
EFFECTS OF CLUSTERED PRESENTATION OF ITEMS FROM THE SAME CLASS AND ELEMENT-SHARING AMONG THESE ITEMS ON PERFORMANCE DURING MULTITRIAL FREE RECALL.
Technical rept.,

by Slater E. Newman. Jun 65, 6p. Rept. no. TR-15
Contract Nonr48608

Unclassified report

Descriptors: (*Recall, Performance tests), Analysis of variance, Classification, Effectiveness, Psychometrics, Learning

Clustered presentation of items from the same class facilitated performance during multitrial free recall. Acquisition was not affected by element-sharing. (Author)

AD-623 150 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
RESPONSE SPEED AS A FUNCTION OF PRONOUNCIABILITY AND TRAINING.
Technical rept.,
by Slater E. Newman. Jun 65, 5p. Rept. no. TR-16
Contract Nonr48608

Unclassified report

Descriptors: (*Verbal behavior, Learning), (*Learning, Verbal behavior), (*Recall, Training), Performance tests, Reaction (Psychology), Analysis of variance

A list of available easy-to-pronounce items took less time to give (i.e., spell) than a list of hard-to-pronounce items. Response speed for each list increased with training. (Author)

AD-623 151 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
EFFECTS OF SERIAL PRESENTATION OF PAIRED ASSOCIATES ON PERFORMANCE DURING AND AFTER TRAINING.
Technical rept.,
by Slater E. Newman. Sep 65, 7p. Rept. no. TR-18
Contract Nonr48608

Unclassified report

Descriptors: (*Training, Performance tests), (*Recall, Training), Analysis of variance, Performance (Human), Effectiveness, Psychometrics, Learning

Serial (compared with random) presentation of paired associates facilitated performance during training and on a random-order test which followed. (Author)

AD-623 152 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
EFFECTS OF CLUSTERING ITEMS FROM THE SAME CLASS ON PERFORMANCE DURING AND AFTER PAIRED-ASSOCIATE TRAINING.
Technical rept.,
by Slater E. Newman. Sep 65, 11p. Rept. no. TR-19
Contract Nonr48608

Unclassified report

Descriptors: (*Learning, Performance tests), (*Training, Effectiveness), Classification, Psychometrics, Correlation techniques, Recall, Analysis of variance

The paper reports the results of three experiments on the effects of clustering items from the same class on performance during and after paired-associate training. Clustering of stimulus terms and response terms was studied. In none of the experiments was pairedassociate learning facilitated. (Author)

AD-623 153 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
RESPONSE SPEED FOR EASY- AND HARD-TO-PRONOUNCE ITEMS.
Technical rept.,
by Slater E. Newman, and Charles M. Williams. Sep 65, 6p. Rept. no. TR-20
Contract Nonr48608

Unclassified report

Descriptors: (*Verbal behavior, Learning), (*Learning, Verbal behavior), Reaction (Psychology), Time, Performance tests, Reading, Training

Response speed (i.e., time to spell) for EP trigrams was greater by about 70 msec than for the HP trigrams. The difference is probably not large enough to affect performance during paired-associate training. (Author)

AD-623 154 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
MULTITRIAL FREE RECALL: EFFECTS OF CLUSTERED PRESENTATION AND INSTRUCTIONS.
Technical rept.,
by Slater E. Newman. Sep 65, 6p. Rept. no. TR-21
Contract Nonr48608

Unclassified report

Descriptors: (*Recall, Performance tests), Analysis of variance, Classification, Effectiveness, Training, Learning

Clustered (compared with separated) presentation of items from the same class facilitated performance during multitrial free recall. The effect was least pronounced when Ss were told about the basis for classifying the items and were instructed to recall the items in clusters; the effect was most pronounced when Ss were not given such instructions. (Author)

AD-623 155 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
STUDIES S-R AND R-S LEARNING.
Final rept. for 1 Oct 60-30 Sep 65,
by Slater E. Newman. 30 Sep 65, 7p. Contract Nonr48608

Unclassified report

Descriptors: (*Learning, Psychometrics), Training, Recall, Performance tests, Reaction (Psychology), Effectiveness, Classification, Time, Analysis of variance

Identification of the processes involved in pairedassociate learning and an understanding of the operation of these processes were the objectives of the research conducted. The approach was that of designing and conducting experiments aimed at testing predictions, a number of which were deducible from a mediation model for paired-associate learning. (Author)

AD-623 156 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF PSYCHOLOGY
THE EFFECT OF RESPONSE-TERM ISOLATION ON PERFORMANCE DURING AND AFTER PAIREDASSOCIATE TRAINING.
Technical rept.,
by John C. Gorham, and Slater E. Newman. Sep 65, 7p. Rept. no. TR-17
Contract Nonr48608

Unclassified report

Descriptors: (*Training, Performance tests), (*Learning, Training), Analysis of variance, Reaction (Psychology), Effectiveness, Colors

Isolating the response term of a paired associate on pairing trials, test trials or both did not affect performance during paired-associate training in which response terms were available on all test trials. However on a test (following training) on which the response terms were not made available, facilitation for the critical pair (relative to other pairs in the list) occurred for those groups trained under pairing-trial isolation. (Author)

AD-623 157 Div. 28/3 ,30/2
CFSTI Prices: HC $6.00 MF $1.50
FMC CORP SANTA CLARA CALIF CENTRAL ENGINEERING LABS
ACCURACY OF SOURCE DATA HUMAN ERROR IN HAND TRANSCRIPTION.
Final technical rept. for 1 Apr 64-31 Mar 65,
by Bruce N. McArthur. May 65, 275p. Rept. no. FMC-R-2234
Contract AF33 615 1276 Proj. 1523 Task 152306
ASD , TR-65-10

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Programming (Computers), Errors), (*Errors, Humans), (*Human engineering, Programming (Computers)), Data processing systems, Character recognition, Numbers, Iterative methods, Programming languages, Factor analysis, Performance tests, Statistical analysis, Graphics, Tables

An experimental human factors study of human error in hand transcription was performed. The objectives were to determine under laboratory conditions, the effects on transcription accuracy of certain human factors, source, data factors, task factors and environmental conditions. The factors were subject age, sex and occupation, arrangement of codes, and code content and structure, transcription method and form design, and work period duration. The general findings were age and sex are significant factors in hand transcription accuracy, the age factor interacts significantly with code content, the sex and occupation factors interact significantly. (Author)

AD-623 171 Div. 28/1
CFSTI Prices: HC $3.00 MF $0.75
STANFORD UNIV CALIF INST FOR MATHEMATICAL STUDIES IN THE SOCIAL SCIENCES
A CORRELATED URN-SCHEME FOR A CONTINUUM OF RESPONSES.
Technical rept.,
by Barry Charles Arnold. 20 Jul 65, 88p. Rept. no. TR-75
Contract AF49 638 1253 Proj. 9778 Task 977801
AFOSR , 65-1594

Unclassified report

Descriptors: (*Learning, Mathematical models), (*Reaction (Psychology), Learning), Conditioned reflex, Correlation techniques, Measure theory

A new model to cover the case of simple learning with a continuum of responses is presented and analysed. Called a correlated urn-scheme, it is an adaption of the continuous analog of the classical urnscheme for learning. The behavior of the model under non-contingent reinforcement is investigated and tests of the applicability of the model are derived. Sufficient conditions, relating to reinforcement schedules, for ergodic behavior in the case of contingent reinforcement are developed using a theorem due to Ionescu-Tulcea. The relation of the correlated urn-scheme to existing models is discussed (with much attention to the much used linear model); and possible generalizations of the urn-scheme are suggested. An empirical comparison with the linear model is presented.

The urn-scheme predicts the same asymptotic response distribution as the linear model but differs in its prediction of sequential dependencies. By this is meant that the urn-scheme and the linear model predict different asymptotic response distributions conditioned on preceding responses and/or reinforcements. That the unconditional response distribution is in good correspondence with observation, has been verified in a number of papers; as has the fact that the linear model's predicted conditional distributions are unsatisfactory. The urn-scheme shows a significant improvement in this area of prediction, as indicated by the included empirical comparison. (Author)

AD-623 173 Div. 28/4 ,15/2 ,16/12
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY
SOME MATHEMATICAL NOTES ON THREE-MODE FACTOR ANALYSIS; THREE-MODE FACTOR ANALYSIS OF PARKER-FLEISHMAN COMPLEX TRACKING BEHAVIOR DATA; A THREE-MODE FACTOR ANALYSIS OF CLINICAL JUDGMENT OF SCHIZOPHRENICITY,
by Ledyard R. Tucker, and David H. Mills. Aug 65, 94p. Contract Nonr183439
Unclassified report

Proj. on Techniques for Investigation of Structure of Individual Differences in Psychological Phenomena.

Descriptors: (*Factor analysis, Psychology), (*Performance (Human), Factor analysis), (*Diagnosis, Mental disorders), Learning, Behavior, Abnormal psychology, Matrix algebra, Sampling, Psychometrics

The model for three-mode factor analysis is discussed in terms of newer applications of mathematical processes including a type of matrix process termed the Kronecker product and the definition of combination variables. A combination method of analysis utilizing Tucker's generalized learning curves and three-mode factor analysis is tried out on intercorrelations of several measures of performance at several stages of practice on a complex tracking task. An analysis is presented of clinical judgment data utilizing a relatively new statistical technique.

AD-623 183 Div. 28/5
CFSTI Prices: HC $3.00 MF $0.50
DELAWARE UNIV NEWARK CENTER FOR RESEARCH ON SOCIAL BEHAVIOR
LEVEL OF INTERPERSONAL EXCHANGE AS A FUNCTION OF THE EASE OF BEING GENEROUS.
Technical rept.,
by Dean G. Pruitt. 20 Oct 65, 56p. Rept. no. TR-15
Contract Nonr228502
Unclassified report

Descriptors: (*Behavior, Social psychology), (*Social communication, Behavior), Mathematical models, Sociometrics, Decision making, Men, Women, Statistical analysis

The hypotheses presented concerning interpersonal exchange were derived from Nash's mathematical model of rational bargaining: The easier it is for one member of a dyad to be generous to the other, (1) the higher costs will both incur and (2) the higher profits will both achieve. If it is easier for member H to provide rewards than for member L, (3) L will incur higher costs than H and (4) L will achieve higher profits than H. An experiment was run in which members of like-sexed pairs alternated providing rewards to one another. All four hypotheses were supported for men and all but the first for women. Hypotheses based on the greatest total profit and distributive justice models failed to be supported at one point or another in the data. (Author)

AD-623 290 Div. 28/4 ,28/1
DELAWARE UNIV NEWARK CENTER FOR RESEARCH ON SOCIAL BEHAVIOR
STRENGTH OF THE RELATIONSHIP BETWEEN THE VALUE OF AN EVENT AND ITS SUBJECTIVE PROBABILITY AS A FUNCTION OF METHOD OF MEASUREMENT,
by Dean G. Pruitt, and Robert D. Hoge. 27 Feb 64, 8p. Contract AF49 638 1441 Grant ,NSF GS311
AFOSR , 65-1584
Unclassified report

Pub. in Journal of Experimental Psychology v69 n5 p483-89 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Probability, Test construction (Psychology)), (*Psychometrics, Probability), Decision making, Behavior, Analysis of variance

The study was designed to evaluate the strength of the relationship between the value of an event and the subjective probability of that event as measured by 3 distinct techniques. A positive relationship was found between these 2 variables under all conditions but diminished in strength as pressures for accuracy increased. The results were discussed in the light of Rotter's criticism of earlier studies. In addition, a comparison was made of the 3 methods of measurement, from which probability ratings emerged as the most reliable technique for studying reactions to objective probability displays. (Author)

AD-623 294 Div. 28/5
SERENDIPITY ASSOCIATES LOS ANGELES CALIF
WIT, CREATIVITY, AND SARCASM,
by Ewart E. Smith, and Helen L. White. 31 Jan 64, 4p. Contract AF49 638 1216
AFOSR , 65-1583
Unclassified report

Pub. in Journal of Applied Psychology v49 n2 p131-4 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Personality, Leadership), (*Leadership, Personality), Social psychology, Behavior, Group dynamics, Verbal behavior, Effectiveness, Stress (Psychology), Sociometrics, Statistical analysis, Correlation techniques

A study was conducted using 156 airmen at their base to test the hypotheses that wit and creativity are positively correlated; that defensiveness and creativity are negatively correlated; and that wits are effective leaders. The effects of sarcastic versus nonsarcastic wit were explored. The 1st 2 hypotheses were supported. Wits were not effective leaders but were associated with less defensiveness and more effective group problem-solving. Most of the positive relationships with wit were found, more specifically, to be associated with sarcastic wit. (Author)

AD-623 312 Div. 28/4 ,28/5
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA GROUP EFFECTIVENESS RESEARCH LAB
TESTS, QUESTIONNAIRES AND TASKS OF THE GROUP EFFECTIVENESS RESEARCH LABORATORY: 1951-1964.
Technical rept.,
by J. Richard Hackman. Jul 65, 82p. Rept. no. TR-24
Contract Nonr183436 Proj. NR177 472 ,ARPA Order 454
Unclassified report

Descriptors: (*Psychometrics, Social psychology), (*Group dynamics, Psychometrics), Leadership, Test construction (Psychology), Perception (Psychology), Performance (Human), Sociometrics

The report presents a collection of research instruments used by the Group Effectiveness Research Laboratory (GERL) of the University of Illinois Department of Psychology from 1951-1964. Its purpose is to provide a single source to which researchers may refer for a summary of the development and application of GERL research instruments. Included are descriptions of seventeen types of tests and questionnaires and fifty-two group tasks in over forty GERL research studies. (Author)

AD-623 325 Div. 28/1 ,28/4
CALIFORNIA UNIV BERKELEY
THE ROLE OF RESPONSE SET IN TESTS OF UNLEARNING,
by Leo Postman, and Karen Stark. 17 Jun 64, 8p. Contract Nonr22290
Unclassified report

Pub. in Journal of Verbal Learning and Verbal Behavior v4 n4 p315-22 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Word association), (*Word association, Recall), Verbal behavior, Retention, Performance (Human), Transfer of training, Psychometrics

Evidence for the unlearning of first-list associations (A-B) during acquisition of a second list (A-C) has been obtained in unpaced tests of modified free recall (MMFR) in which S is required to reproduce both responses to each of the stimuli. The present experiment investigates the extent to which the loss of first-list associations in MMFR is attributable to a set established during IL and carried over inter MMFR, viz., to restrict overt responses to those correct in the second list. In order to maximize the set to give first-list responses, a non-learning task was introduced between the end of IL and MMFR which required active recitation of all first-list associations. Comparison with appropriate control groups shows that (a) the set-inducing proedure increased the dominance of available first-list responses as indexed by the order of recall, but (b) had no effect on the number of such responses recalled, i.e., left the amount of RI unchanged. It appears unlikely, therefore, that a loss of set is responsible for the reduced availability of first-list associations in MMFR. (Author)

AD-623 332 Div. 28/1
BRYN MAWR COLL PA DEPT OF PSYCHOLOGY
THE EVOLUTION OF INTELLIGENCE.
Technical rept.,
by M. E. Bitterman. 1965, 10p. Rept. no. TR-28
Contract Nonr282901 Proj. NR144 132
Unclassified report

Pub. in Scientific American v212 n1 p92-100 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Animals), (*Animals, Learning), Education, Achievement tests, Probability, Fishes, Rats, Monkeys, Pigeons, Reptiles, Brain

Studies of habit reversal and probability learning in the lower animals suggest that brain structures evolved by higher animals do not serve merely to replicate old functions and modes of intellectual adjustment but to mediate new ones (a contradiction of the Thorndike hypothesis). Work with decorticated rats points to the same conclusion. These recent studies represent a new turn in the investigative path founded by Thorndike. Clearly bringing the study into the laboratory was the real first step toward replacing guesses with facts about the evolution of intelligence and its relation to the evolution of the brain. (Author)

AD-623 342 Div. 28/4
PRINCETON UNIV NJ
THURSTONIAN METHODS IN THE MEASUREMENT OF LEARNING,

by Lennart Sjoberg. 1965, 16p. Rept. no. RB-65-33
Contract Nonr185815 Grant NSF G3407 Proj. NR150 088
Unclassified report

Pub. in Scand. J. Psychol. v6 p33-48 1965 (Copies available only to DDC users). Performed in cooperation with Stockholm Univ. (Sweden). Psychological labs.

Descriptors: (*Learning, Psychometrics), (*Psychometrics, Learning), Behavior, Motor reactions, Performance (Human), Test construction (Psychology), Performance tests, Word association, Stochastic processes, Correlation techniques, Reviews

A distinction is discussed between manifest and latent concepts on the one hand and observable and unobservable psychological processes (of which learning is one) on the other. Previous attempts at measurement by Hull and Bjorkman are briefly reviewed. An analysis is presented of improved performance in terms of the latent variables of the Law of Comparative Judgment. Finally, the author's method for successive intervals scaling is applied to some paired associate learning data. (Author)

AD-623 383 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB
INCREMENTAL OR ONE-TRIAL LEARNING OF VERBAL SERIES,
by William H. Sumby. Oct 65, 25p. Rept. no. ESD-TR-64-555
Proj. 7682 Task 768201
Unclassified report

Descriptors: (*Learning, Verbal behavior), Reaction (Psychology), Recall, Memory, Word association, Probability, Psychometrics

The purpose of this study was to demonstrate that with judicious selection of stimulus material, evidence can be gathered to support either an incremental learning position or an all-or-none position. It is shown that if the a priori response probabilities of words in a series are high, the retrieval of that series from memory will lend support to the all-or-none point of view. If, on the other hand, the a priori probabilities are low, the incremental position will be upheld. It is concluded that learning is incremental, but that high response probability will tend to mack the supporting evidence. (Author)

AD-623 464 Div. 28/5,18/1
CFSTI Prices: HC $6.00 MF $1.25
HRB-SINGER INC STATE COLLEGE PA
PSYCHO-SOCIAL PROBLEMS OF SHELTER OCCUPANCY.
Final rept.,
by Grace H. Wright, and William O. Hambacher.
30 Jul 65, 245p. Rept. no. 75111-F
Contract OCD OS65 5 Proj. 1500 Task 1510
Unclassified report

Descriptors: (*Shelters, Social psychology), (*Social psychology, Shelters), Stress (Psychology), Civil defense systems, Projective techniques, Behavior, Adjustment (Psychology)

The project developed a psychological model of protective shelters and a methodology for identifying and describing the psychological stresses and supports existing during ensheltermert. The admission wards of selected psychiatric hospitals were used as an analogue to the shelter confinement with subjects rigorously selected to insure valid extrapolation of results to the projected shelter occupancy population. Emphasis was placed upon studying the psychological rather than the physical environment. The approach utilized a literature collation covering the clinical as well as the traditional stress research in order to define and describe the psychological processes occurring within the shelter. Selected projective techniques, a ward behavior rating form, and an in-house developed selfrating form provided data for ordering the psychological processes under investigation in terms of probability of occurrence and importance of resulting behavior. These data also provided a base for validating comparisons with data from existing occupancy studies. A set of diagnostic tools was developed for use by the shelter manager. A two-man game was constructed and pretested as a screening device for shelter manager use. A set of probable behaviors related to the results obtained from the above were provided as well as a set of remedial actions to be taken by the shelter manager. (Author)

AD-623 534 Div. 28/1
NORTH CAROLINA STATE UNIV RALEIGH
ASYMMETRY IN STIMULUS-TERM AND RESPONSETERM RECALL FOLLOWING PAIRED-ASSOCIATE TRAINING.
Technical rept.,
by Slater E. Newman, Joseph W. Cunningham, and Clifton W. Gray. 1965, 2p. Rept. no. Tr-5
Contract Nonr48608
Unclassified report

Pub. in Psychon. Sci. v2 p297-8 1965 (Copies not available to DDC or Clearinghouse customers). Manuscript available from CFSTI, $2.60, as AD-410 841.

Descriptors: (*Word association, Learning), (*Recall, Word association), Verbal behavior, Memory, Stimulation

Following paired-associate training, R-term recall exceeded S-term recall. This difference was accentuated by an increased amount of paired-associate training. (Author)

AD-623 547 Div. 16/12
CFSTI Prices: HC $6.00 MF $1.25
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
NEUROPSYCHIATRY FOR THE FLIGHT SURGEON,
by John C. Mebane. Sep 62, 231p.
Unclassified report

Descriptors: (*Psychiatry, Aviation medicine), (*Abnormal psychology, Air Force personnel), (*Flight surgeons, Handbooks), Neurology, Military psychology, Personality, Mental disorders, Behavior, Addiction, Psychoses, Neuroses, Reaction (Psychology), Stress (Psychology), Adjustment (Psychology), Motion sickness, Convulsive disorders, Epilepsy, Pathology, Air Force training, Flight, Officer personnel, Selection, Psychometrics, Physical fitness

The text emphasizes an understanding of the complex interpersonal and social problems of the Air Force environment, and their impact upon flyer and doctor alike. Certain topics have been amplified or introduced beyond their consideration in the 'Flight Surgeon's Manual' or in Air Force Manual 160-1 (Medical Examination): Clinical diagnosis and psychosomatic problems are reviewed in the military setting; the Adaptability Rating for Military Aeronautics is explained in detail; neurological problems and psychological reactions to flying stress are emphasized. The vitally important work of the Flight Surgeon in mental health is introduced. The presentations serve to clarify and refine the Flight Surgeon's responsibilities and practice, and are in essential agreement with official Air Force publications on these subjects.

AD-623 548 Div. 16/12,28/3
CFSTI Prices: HC $5.00 MF $1.00
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
MEDICAL ASPECTS OF FLYING MOTIVATION: A FEAR-OF-FLYING CASE BOOK,
by Charles A. Sarnoff. Feb 62, 179p.
Unclassified report

Descriptors: (*Psychology, Aviation personnel), (*Aviation medicine, Psychiatry), (*Psychiatry, Aviation personnel), Stress (Psychology), Anxiety, Motivation, Fear, Reaction (Psychology), Neuroses, Adjustment (Psychology), Abnormal psychology, Flight, Pilots, Flight surgeons, Handbooks, Air force personnel

The purpose of the book is to give the flight surgeon a working knowledge of the many facets of aviation medicine in which flying motivation plays a part. Over fifty full case reports are presented to supplement the flight surgeon's own experience. The proper handling of cases from the standpoint of Air Force regulations and medical indications is discussed; and a system for categorizing patients is offered.

AD-623 556 Div. 28/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
ENGINEERING PSYCHOLOGY BRANCH BIBLIOGRAPHY,
by C. E. Burke. Oct 65, 20p. Rept. no. bib-27
Unclassified report

Descriptors: (*Human engineering, Bibliographies), (*Bibliographies, Human engineering), Industrial psychology, Naval research laboratories, Weapon systems, Training, Training devices, Applied psychology

This bibliography is a revision to date of the bibliography compiled by Bobbie Hosken, August 1959. All unclassified reports issued by the Engineering Psychology Branch between its founding on October 1, 1945 and the present are listed in chronological order. Although many of the early reports are out of print, inquiries concerning any of the listings in this bibliography should be addressed to Director, U. S. Naval Research Laboratory, Washington, D. C. 20390. (Author)

AD-623 558 Div. 28/1,12/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
MANUAL CONTROL OF A PULSE-FREQUENCY MODULATED REACTION CONTROL.
Final rept.,
by John P. Hornseth. Aug 65, 18p. Rept. no. AMRL-TR-65-145
Proj. 7183 Task 718301
Unclassified report

Descriptors: (*Manned spacecraft, Control simulators), (*Performance (Human), Control sticks), Tracking, Human engineering, Reaction (Psychology), Reflexes, Errors, Fuel consumption, Control systems, Pulse modulation, Frequency modulation, Gain, Astronautics

A manual pulse-frequency modulated reaction control is a control with fixed pulse width, fixed pulse amplitude, and manual control of pulse frequency. For such a control, it is possible to maintain a constant reactive force per pulse for various combinations of pulse widths and pulse amplitudes. The controlled element was a one-dimensional second order system. A semirandom sequence of three step voltages was used to displace a spot on a CRT. Subjects were required to recenter the spot as fast as possible. Manual control performance was tested under three levels (low, middle, high) of control output gain. Three pulse width-pulse amplitude combinations were tested at the low and high control output gain levels and four pulse width-pulse amplitude combinations for the middle control output gain level. Three subjects were tested under all conditions. Perfor-

mance measures obtained were: integrated absolute error, integrated absolute fuel consumption, and integrated absolute stick motion. The results of this study indicate that (1) changing pulse width and pulse amplitude, but keeping control output gain fixed, does not affect manual performance; but that (2) changing control gain does. (Author)

AD-623 576 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA UNIV CHAPEL HILL INST FOR RESEARCH IN SOCIAL SCIENCE
ORGANIZATION RESEARCH GROUP.
Terminal technical rept. for 1 Nov 55-31 Oct 65, by John Thibaut. 31 Oct 65, 11p. Contract Nonr85504

Unclassified report

See also AD-608 226.

Descriptors: (*Social psychology, Scientific research), (*Group dynamics, Behavior), Perception (Psychology), Bargaining, Psychometrics, Motivation, Adjustment (Psychology)

The focus was steadily fixed on illuminating the processes of group functioning. Topics to which special attention was directed include the following: social perception, role behavior, conformity to group norms, group effectiveness and productivity, status mobility, the development of cooperation, achievement motivation, the development of contractual norms, and bargaining behavior. The main body of the report consists of two year-by-year listings, first of the books, monographs, chapters, and journal articles published under the ONR contract, and second, of the dissertations and theses completed under the same auspices. (Author)

AD-623 601 Div. 28/3
ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB
ACOUSTIC FACILITATION OF VISUAL DETECTION.
Supplementary repts.,
by William H. Watkins, and Carl E. Feehrer. 25 Jan 65, 2p. Proj. ESD 7682
ESD , TR-65-156

Unclassified report

Pub. in Journal of Experimental Psychology v70 n3 p332-3 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Visual perception, Auditory perception), (*Auditory signals, Visual signals), Reaction (Psychology), Noise

Eleven Os were required to judge which of 4 temporal intervals contained a visual signal, in an experiment involving a total of 10,900 trials. Under some conditions, potentially useful time information was conveyed by accompanying sound stimulation, while it was lacking under others. Highest detectability of the signal was associated with an acoustic condition having white noise bursts coincident with each observation interval. Those detection scores were significantly superior to a 'reciprocal' condition having the identical amount of acoustic time-specification information. Detection was poorest under continuous noise and silence, which were not discernably different in their effects. Simple time cueing was inferred not to provide an adequate explanation for the results. (Author)

AD-623 619 Div. 28/2 ,32/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
APPLICATION OF BEHAVIORAL SCIENCE TO PERFORMANCE AID DEVELOPMENT.
State-of-the-art rept.,
by Donald A. Topmiller. Aug 65, 20p. Rept. no. AMRL-TR-65-146
Proj. 7184 Task 718406

Unclassified report

Descriptors: (*Human engineering, Display systems), (*Data processing systems, Human engineering), (*Instruction manuals, Human engineering), Numbers, Maintenance, Maintainability, Malfunctions, Air force equipment, Specifications, Systems engineering, Checkout procedures, Simulation, Design

Four classes of variables relevant to behavioral research on the development of performance aids (technical orders, maintenance manuals, etc.) are outlined: (a) Legibility and Format Variables; (b) Variables Associated with Processing Printed Numeric Information; (c) Variables Associated with the Physical Configuration of Performance Aids; and, (d) Variables Associated with Troubleshooting Informational Processing and Display Systems. Each of these topics is discussed within a historical framework, with supporting empirical research. Some predictions are made for future trends in performance-aid behavioral studies. (Author)

AD-623 626 Div. 28/1
NEW YORK UNIV N Y
THE ANCHOR FOR THE SERIAL POSITION CURVE,
by Murray Glanzer, and Richard Dolinsky. 22 May 64, 7p.

Unclassified report

Pub. in Journal of Verbal Learning and Verbal Behavior, v4 n4 p267-73 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Toledo Univ., Ohio.

Descriptors: (*Learning, Verbal behavior), (*Verbal behavior, Learning), Reaction (Psychology), Inhibition, Analysis of variance, Psychometrics

Two experiments were carried out to determine the cue used by Ss to anchor the serial position curve in rote learning. Experiment I was designed to evaluate the role of starting position and facilitated (pretrained) syllable in lists that contained no other cues as to beginning or end (closed cycle lists). The results show that the Ss anchor the curve on the starting position. These findings contradict both facilitation and inhibition explanations of the serial position curve. On the basis of facilitation constructs it would be predicted that serial position curve should anchor on a facilitated syllable. On the basis of inhibition constructs it would be predicted that there should be no serial position effect in a closed cycle list. As an alternative to these it is suggested that the S makes a choice of anchor position and that any cue, position or list characteristic may serve as anchor for the curve. From this it follows that E should be able to instruct the S as to the anchor point. In Exp. II the E varied the indication of the beginning of the list by means of verbal instructions. The results show that the anchor point can be manipulated in this manner. (Author)

AD-623 637 Div. 28/4
CFSTI Prices: HC $1.00 MF $0.50
DUNLAP AND ASSOCIATES INC SANTA MONICA CALIF WESTERN DIV
TIME AND ACCURACY AS MEASURES OF HUMAN PERFORMANCE: A CRITICAL REVIEW OF THE LITERATURE,
by R. L. Smith. Sep 65, 27p. Contract Nonr431400

Unclassified report

Descriptors: (*Performance tests, Reviews), (*Performance (Human), Standards), Time, Errors, Motor reactions, Stress (Psychology), Time studies, Personnel management, Effectiveness

The paper presents a review of the literature related to the performance of simple sensory and/or sensorymotor activities in terms of two factors: the optimal time to perform such activities, and the degradation in accuracy, if any, under time stress. The purpose of this literature review was to seek findings which (1) could aid in evaluating the validity, utility and generalizability of existing mathematical models intended to derive personnel performance standards from system effectiveness requirements, and (2) would provide the information for: (a) accurately deriving personnel performance standards in terms of time, and (b) evaluating the possible effect on system effectiveness of varying time constraints.

AD-623 652 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB
INCREMENTAL OR ONE-TRIAL LEARNING OF VERBAL SERIES,
by William H. Sumby. Oct 65, 25p. Proj. 7682 Task 768201
ESD , TR-64-555

Unclassified report

Descriptors: (*Learning, Psychometrics), Analysis of variance, Verbal behavior, Errors, Performance tests, Probability

The purpose of this study was to demonstrate that with judicious selection of stimulus material, evidence can be gathered to support either an incremental learning position or an all-or-none position. It is shown that if the a priori response probabilities of words in a series are high, the retrieval of that series from memory will lend support to the all-or-none point of view. If, on the other hand, the a priori probabilities are low, the incremental position will be upheld. It is concluded that learning is incremental, but that high response probability will tend to mask the supporting evidence. (Author)

AD-623 674 Div. 28/3 ,8/7
CFSTI Prices: HC $3.00 MF $0.50
VIRGINIA UNIV CHARLOTTESVILLE PSYCHOLOGICAL LAB
VIRGINIA CUTANEOUS PROJECT 1948 - 1962.
Final rept.
1962, 58p. Contract N7onr37202 ,Nonr47406
Proj. NR140 598

Unclassified report

Descriptors: (*Skin, Sensory perception), (*Sensory perception, Touch), (*Communication theory, Sensory perception), (*Touch, Sensory perception), Vibration, Stimulation, Reaction (Psychology), Psychophysiology, Bibliographies

Bibliography of research on the possibility of utilizing the vibratory sensitivity of the skin as a means of communication.

AD-623 683 Div. 28/1
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
THE EFFECTS OF HIGH AMBIENT TEMPERATURE ON SHORT-TERM MEMORY.
Final rept. for Sep 61-May 63,
by John F. Wing, and Robert M. Touchstone.
Sep 65, 29p. Rept. no. AMRL-TR-65-103
Proj. 1710 Task 171002

Unclassified report

Descriptors: (*Memory, Temperature), (*Recall, Temperature), (*Stress (Physiology), Recall), Stress (Psychology), Exposure, Tolerances (Physiology), Reaction (Psychology), Analysis of variance, Performance tests

The study was designed to determine whether or not an increase in ambient temperature impaired man's ability to recall aurally-presented messages, and whether impairment was greater for some types of messages than for others. On three separate days, 15 men were exposed for 1 hour in an

all-weather chamber to each of three different effective temperatures (ET): 72F, 90F, and 95F. During each day's session they were given five successive recall trials on each of six different messages. The men had to work continuously during each hour-long session. The results showed that average recall dropped significantly as environmental temperature was increased. The recall decrement between 90F and 95F was statistically significant, but the drop in recall between 72F and 90F was not significant. Messages of all types suffered approximately equal decrements under the high temperatures. (Author)

AD-623 686 Div. 28/2
CFSTI Prices: HC $1.00 MF $0.50
PITTSBURGH UNIV PA GRADUATE SCHOOL OF BUSINESS
BEHAVIOR IN GROUPS.
Annual rept.,
by Bernard M. Bass. 15 Nov 65, 20p. Rept. no. AR-3
Contract Nonr62414
Unclassified report

See also AD-608 642.

Descriptors: (*Group dynamics, Behavior), (*Industrial psychology, Group dynamics), Management control systems, Social psychology, Training, Culture, Decision making, Costs, Effectiveness

Research efforts progressed during the year 1964-5 on five programs: orientation and social behavior, simulated organizations, management consultative patterns, organizational conflict resolution and management development. A text 'Organizational Psychology' was published and a new combined management training and research technique was tried out. In addition, a program was initiated for the cross-cultural study of administrative behavior.

AD-623 691 Div. 28/5
CFSTI Prices: HC $3.00 MF $0.75
PITTSBURGH UNIV PA GRADUATE SCHOOL OF BUSINESS
SOCIAL BEHAVIOR AND THE ORIENTATION INVENTORY: A REVIEW.
Technical rept.,
by Bernard M. Bass. Nov 65, 92p. Rept. no. TR-9
Contract Nonr62414
Unclassified report

Descriptors: (*Social psychology, Reviews), (*Motivation, Group dynamics), Personality, Reaction (Psychology), Reliability, Psychometrics, Leadership, Behavior

The report is a review of research between 1959 and 1965 relating Orientation Inventory (Ori) scores to various kinds of other self-reports and to performance in controlled experiments. Although many of the studies are based on small samples and Ori scores are relatively low in retest reliability, the overall patterns of results suggest the utility of assessing orientation as a way of increasing understanding of performance in a variety of social situations. In many such situations, the greatest source of variance may be the interaction of individual orientation and the nature of the task. What is punishing for the selforiented, may be of no consequence to the interactionoriented and be positively reinforcing to the task-oriented. (Author)

AD-623 120 See Fld. 1/3

AD-623 126 See Fld. 6/16

AD-623 126 See Fld. 6/16

AD-623 205 See Fld. 9/2

AD-623 247 See Fld. 6/16

AD-623 346 See Fld. 6/16

AD-623 347 See Fld. 6/16

AD-623 348 See Fld. 6/16

AD-623 349 See Fld. 6/16

AD-623 350 See Fld. 6/16

AD-623 365 See Fld. 6/16

AD-623 378 See Fld. 6/15

AD-623 389 See Fld. 13/7

AD-623 492 See Fld. 6/3

AD-623 497 See Fld. 6/15

AD-623 529 See Fld. 5/9

AD-623 631 See Fld. 6/15

5/11. SOCIOLOGY

AD-623 172 Div. 32/9
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D C
CHINESE 'THOUGHT REFORM' AS A SOURCE OF PERSPECTIVES TOWARD WESTERN CORRECTIONAL PRACTICE.
Technical memo.,
by Albert D. Biderman. 20 May 65, 11p. Contract AF49 638 1344 Proj. 9779 Task 977902
AFOSR, 65-1205
Unclassified report

Descriptors: (*Brainwashing, Communists), Attitudes, Behavior, Prisoners, Culture, Criminology, Sociology, China

Studies of Chinese Communist 'brainwashing' practices proceeded with little reference to Western literature on penology and correction. When serious comparative consideration of Western and Chinese reform efforts did take place, however, the normative outlook from which Westerners had viewed Chinese 'thought reform' gave uniquely valuable perspectives on Western practices. Several illustrations are given of how the examination of deplored reform practices can provide valuable, chastening insights regarding the meaning and effectiveness of reform efforts that one values positively. The sympathetic regard of Western observers for those they considered victims of the Chinese practices contrasts with difficulties practitioners have in identifying with the subjects of their own correctional procedures. The explicity positive valuation which was placed on the efforts of subjects to resist 'brainwashing' contrasts with the tendency of practitioners to regard resistance as obduracy. The literature on 'brainwashing' emphasizes the malleability of attitudes and behavior as contrasted with the emphasis on the intractability of inmates or patients typical of Western correctional literature. Despite great difference in theories applied by practitioners, similar emotional reactions are experienced by their subjects. (Author)

6/1. BIOCHEMISTRY

AD-623 182 Div. 16/3,4/4
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
THE KINETICS OF MULTICENTER MACROMOLECULE GROWTH ALONG A TEMPLATE,
by J. M. Zimmerman, and Robert Simha. 15 Oct 64, 31p. Contract Nonr22821
Unclassified report

Pub. in J. Theoret. Biol. v9 p156-85 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Rocketdyne, Canoga Park, Calif.

Descriptors: (*Polymers, Biosynthesis), (*Nucleic acids, Polymerization), (*Polymerization, Reaction kinetics), Diffusion, Chemisorption, Enzymes, Propagation, Models (Simulations), Statistical analysis, Probability, Molecular structure, Special functions (Mathematical)

A previously developed kinetic theory of polymer replication on linear, effectively single stranded templates is extended to the case of several simultaneously growing chains. The basic assumptions are diffusion of monomer to the template and subsequent reaction of two monomers on adjacent sites competing with monomer desorption. The role of the first order arrival in time. Particular emphasis is given to the two-center case and numerical calculations are carried out, assuming the first center to be initiated at one end of the template. The solutions for conversion, average molecular weight and dispersion are expressed ultimately in terms of incomplete gamma functions. A comparison with the previous single center kinetics indicates a significant effect of the addition of a second growing chain. However, the molecular weight dispersions in these two models are very similar. The only significant difference is the slower approach to the final homogeneity with increasing conversion in the latter case. This suggests that experimental discrimination between one and two chain replication by direct analysis of the dispersion is not feasible except for relatively large conversions. (Author)

AD-623 375 Div. 16/3,16/11
OXFORD UNIV (ENGLAND) DEPT OF PHARMACOLOGY
HYDROXYINDOLE OXIDASE IN THE CRYSTALLINE STYLE OF PINNA NOBILIS,
by Hermann Blaschko. 11 May 65, 12p. Contract AF EOAR12 64 Proj. 9777 Task 977701
AFOSR, 65-1549
Unclassified report

Pub. in Rivista di Biologia v58 pt1 p27-36 Jan-Mar 1965 (Copies available only to DDC users).

Descriptors: (*Mollusca, Enzymes), (*Gastropoda, Oxidoreductases), (*Oxidoreductases, Gastropoda), Digestive system, Organic pigments, Psilocin, Oxidation, Great Britain

Experiments were conducted on the hydroxyindole oxidase activity of an enzyme present in crystalline Pinna nobilis. It is shown that a homogenate of the crystalline style oxidizes psilocine with the formation of a blue pigment. This activity was also observed in the gill plates of Mytilus edulis and is described as an expression of the phenol oxidase activity in these tissues. This finding is discussed in relation to earlier observations on the presence of a phenoloxidase in mollusks. (Author)

AD-623 493 Div. 16/3,16/1,16/4
BRANDEIS UNIV WALTHAM MASS GRADUATE DEPT OF BIOCHEMISTRY
EVOLUTION OF LACTIC DEHYDROGENASES,
by A. C. Wilson, N. O. Kaplan, L. Levine, A. Pesce, and M. Reichlin. 1964, 12p. Contract AF AFOSR214 63,NsG375 Proj. 9777 Task 977701
AFOSR, 65-1512
Unclassified report

Pub. in Federation Proceedings v23 n6 pt1 p125866 Nov-Dec 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Oxidoreductases, Molecular structure), (*Proteins, Molecular structure), Enzymes, Molecular weight, Amino acids, Chromatographic analysis, Electrophoresis, Stability, Catalysis, Coenzymes, Hemoglobin, Complement, Immunology

Twenty-five lactic dehydrogenases were purified and crystallized from various species. Several methods were used to compare the structures of these enzymes, including determinations of molecular wt, amino acid composition, and fingerprint pattern. Lactic dehydrogenases in crude extracts of many other species were investigated by measurements of temperature stability, electrophoretic mobility, and catalytic activity with coenzyme analogs. The quantitative microcomplement fixation method was used to compare the structures of hemoglobins and of several other proteins. The method is more sensitive to differences in protein structure than are conventional, quantitative immunological methods. Single amino acid differences among hemoglobins are easily detected by this method. The method also provides an approximate measure of the degree of structural resemblance between various hemoglobins of known sequence. Microcomplement fixation was used to examine the rates of protein evolution. The proteins studied were H4 and M4 lactic dehydrogenases, triose phosphate dehydrogenase, glutamic dehydrogenase, aldelase, and hemoglobin. The results suggest that, in a given species, all these proteins tend to change in immunological structure at similar rates. (Author)

AD-623 508 Div. 16/3 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
HARVARD UNIV CAMBRIDGE MASS DEPT OF CHEMISTRY
POLYPEPTIDES.
Final rept. for 1 Sep 56-31 May 63,
by Paul Doty. 5 Oct 65, 10p. Contract N5ori07654 Proj. NR055 379

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Peptides, Stereochemistry), (*Stereochemistry, Peptides), Proteins, Solutions, Molecular properties, Helices, Refraction, Spectra (Infrared), Molecular rotation

Brief summaries of the following studies are given: Flow birefringence of poly-gamma-benzyl- L-glutamates; conform changes in paramyosin; correlation of IR spectra and optical rotary dispersion in polypeptide conformation studies. Included is a list of publications generated under the contract, which was generally concerned with the existence and implications of an alpha-helical configuration in polypeptides in solution.

AD-623 629 Div. 16/3
EDSEL B FORD INST FOR MEDICAL RESEARCH DETROIT MICH
RECENT STUDIES ON THE DPNH DEHYDGOGENASE OF THE RESPIRATORY CHAIN,
by Thomas P. Singer. 1965, 35p. Contract Nonr165600 Grant ,NIH HE01995

Unclassified report

Pub. in Non-Heme Iron Proteins: Role in Energy Conversion, p349-82 1965, a Symposium sponsored by the Charles F. Kettering Research Lab. (Copies not available to DDC or Clearinghouse customers). Research supported in part by NSF contract NSF G20457.

Descriptors: (*Oxidoreductases, Reviews), (*Proteins (Conjugated), Oxidoreductases), Iron compounds, Thiols, Sulfides, Inhibition, Reaction kinetics, Phosphates, Organic pigments, Coenzymes, Respiration

A survey is presented of information accrued in he author's laboratory concerning DPNH dehydrogenase, particularly in regard to its labile sulfide component and the related problem of the role of SH groups in the action of this enzyme. Some recent data on the interaction of the dehydrogenase with coenzyme Q are also presented.

AD-623 126 See Fld. 6/16

AD-623 335 See Fld. 6/13

AD-623 362 See Fld. 6/3

AD-623 380 See Fld. 6/13

AD-623 475 See Fld. 7/4

AD-623 490 See Fld. 6/15

AD-623 538 See Fld. 6/16

6/3. BIOLOGY

AD-623 178 Div. 16/4
WISCONSIN UNIV MADISON DEPT OF ZOOLOGY
THE JUVENILE HORMONE-I. METHODS OF PURIFICATION AND ISOLATION,
by H. Roller, J. S. Bjerke, and W. H. McShan. 23 Mar 65, 14p. Contract Nonr120214 Proj. NR108 441

Unclassified report

Pub. in Journal of Insect Physiology v11 p1185-97 1965 (Copies available only to DDC users).

Descriptors: (*Insects, Hormones), (*Hormones, Insects), Solvent extraction, Chemical precipitation, Chromatographic analysis, Purification, Biological assay, Coleoptera

Methods for the purification and isolation of juvenile hormone from Hyalophora cecropia are described. Ether extraction, low temperature precipitation, thin layer chromatography, and gas liquid chromatography were utilized. JH activity was followed by means of the Tenebrio bioassay. An apparent gain in activity of approximately five-fold was obtained during the course of purification. This was interpreted to be largely the result of a loss of inhibitors during the low temperature precipitation procedure. The final active material, indicated to be a single compound by preliminary gas liquid chromatographic analysis, represented 0.00450.0051 per cent of the crude oil used as starting material. The juvenile hormone activity was increased from 25 Tenebrio Units per microliter for the crude oil to approx. or = 2.6 x 10 to the 6th power Tenebrio Units per microliter for the final active substance. This represents an approximate 1.05 x 10 to the 5th power-fold purification. (Author)

AD-623 256 Div. 16/4 ,2/9
CFSTI Prices: HC $1.00 MF $0.50
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
SEA SNAKES (HYDROPHIIDAE) OF THE GULF OF TONKIN (NORTHERN VIET-NAM) (MORSKIE ZMEI (HYDROPHIIDAE) TONKINSKOGO (SEVERO-V'ETNAMSKOGO) ZALIVA),
by V. P. Shuntov. 1965, 10p. Rept. no. trans-240 TT , 65-64466

Unclassified report

Trans. of Zoologicheskii Zhurnal (USSR) v41 n8 p1203-9 1962.

Descriptors: (*Reptiles, Aquatic animals), (*Tonkin Gulf, Reptiles), (*Aquatic animals, Reptiles), Marine biology, Ecology, Oceanographic data, USSR

Seven species of sea snakes have been found in the Tonking Bay: Pelamis platurus, Lapemis hardwickii, Hydrophis fasciatus, H. Cyanocinctus, H. ornatus, Microcephalophis gracilis and Thalassophina viperina. The first three species are the prevailing ones. The bulk of L. hardwickii inhabits the litoral. P. platurus has been found in the open parts of the bay. H. fasciatus enjoys an intermediate position between the two mentioned species. Such factors as depth, salinity, temperature, etc. influence the distribution of the sea snakes throughout the bay. In springtime the main concentration of sea snakes is observed in the centrum of the eastern part of the bay where the warm current coming from the South-Chinese Sea passes. In summer the sea snakes move towards more shallow areas. Mainly pelagic species were not observed (P. platurus and H. fasciatus) in the utmost western and northern sections of the bay owing to the decreased salinity. (Author)

AD-623 315 Div. 16/4
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
THE EVOKED VOCAL RESPONSE OF THE BULLFROG; A STUDY OF COMMUNICATION BY SOUND.
Special technical rept.,
by Robert R. Capranica. 1965, 115p. Rept. no. STR-12 ,Research Mono-33
Contract DA36 039AMC03200E Grant ,NSF GP2495

Unclassified report

Available from MIT Press, Cambridge, Mass., $5.00.

Descriptors: (*Amphibians, Sound), Hearing, Auditory perception, Auditory signals, Nervous system, Physiology, Behavior, Stress (Physiology), Reproduction (Physiology), Stimulation, Frequency, Ecology

The research attempts to bridge the existing gap between the naturalistic observations of sound communication in anurans and the anatomical and physiological findings in their auditory nervous system. The motivation for this research concerns the author's interest in the neural representation of complex meaningful sounds - stimuli for which the nervous system is presumably designed to process. Such a representation, although suggested by electrophysiological recordings of patterns of activity in various neural centers, requires a behavioral confirmation that these, in fact, are the principles by which information is processed within the intact animal. To this end, vocal behavior has been evoked from the males of laboratory colonies of bullfrogs (Rana catesbeiana) in response to a restricted class of natural and synthetic sounds. The evoked vocal responses, having the signal characteristics of the bullfrog's mating call, were highly selective. To playbacks of the mating calls of 34 different species of frogs and toads, only the mating calls of certain male bullfrogs would evoke calling from the laboratory animals. By employing a standardized experimental technique, quantitative measures of evoked calling have been obtained for a large number of synthesized bullfrog mating calls.

AD-623 338 Div. 16/4
STOCKHOLM UNIV (SWEDEN) DEPT OF ZOOLOGY
LONG RANGE NAVIGATION IN ANIMALS.
Final scientific rept.,
by Carl G. Edelstam. 10 Jun 65, 51p. Contract AF EOAR6 63
AFOSR , 65-1566

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Navigation, Animals), Celestial navigation, Fishes, Reptiles, Birds, Bats, Visual acuity, Semicircular canals, Behavior, Radio waves, Altitude, Gravity, Coriolis effect, Terrestrial magnetism, Sensory perception, Rhythm (Biology), Sweden

The physical and sensory basis of navigation in fish, turtles, birds, and bats has been examined theoretically and by experiment. The stars are found to be superior for several reasons to the sun as potential cues in visual navigation. The advantage of non-visual over visual navigation increases rapidly with increasing size of the sense organs, which may help to explain certain differences in homing behaviour between small and large animals. Methods are suggested to differentiate between navigation systems based on measurements of (a) the altitude of the stars, (b) the altitude of the sun, (c) the position of celestial radio sources, (d) the inertial forces experienced during the outward journey prior to homing, (e) the intensity of gravity, (f) the intensity and direction of the Coriolis force, and (g) the intensity and direction of the geomagnetic field. Some results of such tests and of other experiments are reported. (Author)

AD-623 345 Div. 16/4
WICHITA STATE UNIV KANS DEPT OF BIOLOGY
MUTAGENICITY OF CYTOSINE FOR AN ADENINE AND ARGININE REQUIRING STRAIN OF CADIDA ALBICANS,
by A. Sarachek. 1965, 8p. Contract Nonr20102

Unclassified report

Pub. in Mycopathologia et Mycologia Applicata v26 n1 p72-8 1965 (Copies available only to DDC users).

Descriptors: (*Candida, Mutations), (*Mutations, Desoxyribonucleic acids), (*Nucleotides, Candida), Amino acids, Adenine, Guanine, Growth, Inhibition, Purines, Nucleic acids, Culture media, Pyrimidines

An adenine-arginine double auxotroph of Candida albicans exhibits increased back mutation to arginine independence when cultivated in the presence of growth inhibiting levels of cytosine. Of the natural nucleic acid bases, only adenine or guanine relieve growth inhibition and mutation; adenine is more effective than guanine in relieving inhibition but less effective than guanine in preventing mutation. Previous studies have shown that cytosine renders adenine auxotrophs of C. albicans purine deficient by competitively interfering with their utilization of exogenous adenine. The mutagenic effect of cytosine reported here is attributed to a cytosine induced cellular deficiency for guanine which favors the erroneous incorporation into replicating DNA of other nucleotides in place of the guanine nucleotide. (Author)

AD-623 358 Div. 16/4
DELAWARE UNIV NEWARK
ELECTROCARDIOGRAM OF THE ARMADILLO,
by Charles G. Wilber. 26 May 63, 3p. Contract DA49 193MD2627

Unclassified report

Pub. in Journal of Mammology v45 n4 p642 Jan 25 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mammals, Electrocardiography), (*Electrocardiography, Mammals), Cardiovascular system, Heart, Blood circulation, Physiology, Vertebrates

AD-623 362 Div. 16/4 ,16/1 ,16/3
CALIFORNIA UNIV BERKELEY
SOME OBSERVATION ON AIR-ION-ENHANCED IRON CHLOROSIS IN BARLEY (HORDEUM VULGARIS) SEEDLINGS,
by Sadao Koraka, Albert P. Krueger, and Paul C. Andriese. 10 Dec 64, 13p. Contract Nonr365606 Proj. NR102 587

Unclassified report

Pub. in Plant and Cell Physiol. v6 p233-45 1965 (Copies available only to DDC users).

Descriptors: (*Air pollution, Plants (Botany)), (*Plants (Botany), Deficiency diseases), (*Grasses, Deficiency diseases), (*Iron, Metabolism), Air, Ions, Chlorophyll, Biosynthesis, Organic pigments, Enzymes, Tracer studies, Growth

The air ion effects on 'active' and 'residual' iron distribution in barley seedlings were studied in the course of the development of iron-chlorosis in an ironfree culture medium. Ions of either charge induced a significant decrease in active iron content which was associated with a decrease in chlorophyll content. Concomitantly, there occurred an increase in both the residual iron and the cytochrome c fractions. The increase in residual iron content may involve not only cytochrome c but also other cytochromes and ironcontaining enzymes as well. It is proposed that the site of air ion action in the experiments reported may be the regulatory systems controlling iron metabolism in the seed and young seedling. Through this action air ions apparently divert more endogenous free-state iron to residual iron (consisting of cytochromes and Fe-containing enzymes) than to active iron. Tracer experiments showed that air ions enhanced the uptake of exogenous iron by early germinating barley seeds. The increased incorporation of iron was not influenced by light. (Author)

AD-623 368 Div. 16/4 ,16/11
BUENOS AIRES UNIV (ARGENTINA) INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA
A NON-CHOLINERGIC SYNAPTIC INHIBITION IN THE CENTRAL NERVOUS SYSTEM OF A MOLLUSC,
by H. M. Gerschenfeld. 1965, 4p. Contract AF AFOSR656 64
AFOSR , 65-1942

Unclassified report

Pub. in Nature v203 n4943 p415-6 (Copies available only to DDC users).

Descriptors: (*Mollusca, Central nervous system), (*Central nervous system, Mollusca), Nerve cells, Ganglia, Acetylcholine, Stimulation, Inhibition, Nerve impulses, Sympatholytic agents, Argentina

AD-623 369 Div. 16/4 ,16/11
BUENOS AIRES UNIV (ARGENTINA) INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA
ACTION OF GLUTAMIC ACID AND OTHER NATURALLY OCCURRING AMINO-ACIDS ON SNAIL CENTRAL NEURONS,
by H. M. Gerschenfeld, and A. Lasansky. 1964, 15p. Contract AF AFOSR656 64
AFOSR , 65-1944

Unclassified report

Pub. in International Journal of Neuropharmacology v3 p301-14 1964 (Copies available only to DDC users).

Descriptors: (*Gastropoda, Central nervous system), (*Central nervous system, Gastropoda), (*Glutamic acid, Central nervous system), Nerve cells, Amino acids, Nerve impulses, Argentina

The action of glutamic acid and other naturally occurring amino-acids in gasteropod nervous system was studied on the central neurons of the snails Cryptomphallus aspersa and Helix pomatia, using microelectrophysiological methods. Snail neurons are sensitive to glutamic acid in concentrations 5 X 10 to the minus 7th power M. This amino-acid may produce opposite effects on different cells: Some neurons are depolarized and excited, while others are hyperpolarized and excited, while others are hyperpolarized and inhibited. These responses can be elicited both by perfusion and local ionophoretic injection of the drug. The hyperpolarizing effect shows an inversion potential of ca-60 mV. Glutamic acid in concentrations of 0.001M strongly diminishes the membrane resistance In more diluted solutions it may affect the spike propagation mechanism. Monocarboxylic and dicarboxilic amino-acids may or may not have the same effect on different neurons. In a great number of cells GABA has a strong depolarizing action. Glutamate receptors of snail neurons show desensitization when the action of the drug is depolarizing but they are not desensitized when the drug hyperpolarizes the neuron. The results are discussed in relation to the mechanisms of drug action and synaptic transmission in the snail nervous system. (Author)

AD-623 420 Div. 16/4 ,14/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
NEW METHODS FOR EFFECTING WATERTIGHT SEALS ON CORN ROOTS,
by E. C. Evans,III, AND B. E. Vaughan. 14 Sep 65, 14p. Rept. no. USNRDL-TR-910
Proj. RDT ;E SR011 01 01 Task 0401

Unclassified report

Descriptors: (*Corn, Seals (Stoppers), Sealing compounds, Capillary tubes, Tracer studies

Two effective methods of sealing corn roots into capillary glassware are described. One involves only a slight pressure on the root but cannot withstand hydrostatic pressures across the seal in excess of 15 cm of water. The second, capable of withstanding 2 meters of hydrostatic pressure, requires a melted sealing compound which can raise the root epidermis to temperatures between 50 and 56 C for about 2 seconds. Experiments using radioactive tracers have demonstrated that both seals effectively prevent ionic movement external to theroot proper and that the heat-sealing process does not alter the root's absorption-transport capacity. (Author)

AD-623 492 Div. 16/4 ,28/3
COMMUNICATION RESEARCH INST MIAMI FLA
VOCAL MIMICRY IN TURSIOPS: ABILITY TO MATCH NUMBERS AND DURATION OF HUMAN VOCAL BURSTS,
by John C. Lilly. 1965, 4p. Contract AF AFOSR415 63 Proj. 9777 Task 977701
AFOSR , 65-1513

Unclassified report

Pub. in Science v147 n3655 p300-1 Jan 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cetacea, Sound), (*Humans, Speech), Marine biological noise, Behavior, Learning

In addition to its normal underwater sonic communication path, the dolphin, Tursiops truncatus, can be trained to emit sounds from the blow-hole opened in air. By proper rewarding and evocative techniques, such vocal emissions can be changed from the natural Patterns. One such group of new sounds is said to resemble the human voice. Aspects of these sounds which are physically determinable, specifiable, and demonstrable are the similarities in numbers of bursts of sound emitted by man and dolphin and in durations of successive emissions. In 92% of the exchanges the number of bursts emitted by Tursiops equalled, !1, the number just previously emitted by a man in sequences of 1 - 10 bursts. (Author)

AD-623 494 Div. 16/4 ,30/3
CALIFORNIA UNIV LOS ANGELES SPACE BIOLOGY LAB

RECORDING LEAF MOVEMENTS WITH A STRAIN GAUGE,
by T. Hoshizaki, and K. Yokayama. 1965, 5p. Contract AF AFOSR246 63 ,NsG528
Unclassified report

Pub. in Nature, v207 n4999 p880-1 Aug 21 1965. (Copies available only to DDC users) Prepared in cooperation with National Aeronautics and Space Administration, Moffet Field, Calif. Ames Research Center.

Descriptors: (*Plants (Botany), Motion), (*Motion, Recording systems), Strain gages

A small lightweight leaf movement recording system using a strain gauge coupled to an amplifier and a recorder was devised. The need for such a system was dictated by the physical limitations of an orbiting capsule. We have also found that such a system is useful for earthbound experiments was devised. The small size of the sensing unit makes it possible to place several units on a single plant. The monitored plant can easily be placed in a small control chamber and continuous records of several weeks' duration can be obtained when the movements are recorded on a strip chart recorder.

AD-623 493 See Fld. 6/1

6/5. CLINICAL MEDICINE

AD-623 187 See Fld. 6/12

AD-623 690 See Fld. 6/16

6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

AD-623 187 Div. 16/8 ,16/13
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DERMATOME, MODEL 205.
20 Oct 65, 18p. Rept. no. FTD-TT-65-1561 TT , 65-64420
Unclassified report

Unedited rough draft trans. of mono. Dermatom - Model' 205, 1965 14p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Transplantation, Skin), (*Surgical instruments, Transplantation), Surgical techniques, Medical equipment, Plastic surgery, Burns, USSR

The dermatome is intended for cutting off free skin layers of various thicknesses for the purpose of transplanting. It is used in conjunction with skin transplants into expensive, granulating surfaces after third degree burns, for cutting away various types of extensive scars and contractures, and in a series of other plastic operations. (Author)

AD-623 678 Div. 16/8
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
A NEW TRAY FOR IMPROVED GIEMSA STAINING OF BLOOD FILMS,
by Donald L. Price. 19 Apr 65, 4p.
Unclassified report

Pub. in The American Journal of Clinical Pathology v44 n4 p 482-4 Oct 1965 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Biological stains, Laboratory equipment), (*Laboratory equipment, Biological stains), (*Blood analysis, Laboratory equipment), Blood cells, Parasites

A staining tray was designed for staining thick and thin blood films with the film face down. Blood films from various sources stained on the tray were more evenly stained and had less dust, debris, and stain particles than films stained with the film up on a tubular rack or in Coplin jars. Blood cells and parasites were not transferred from 1 slide to another during the staining process when the tray was used. (Author)

6/13. MICROBIOLOGY

AD-623 335 Div. 16/2 ,16/11,16/3
CFSTI Prices: HC $2.00 MF $0.50
ARMY NATICK LABS MASS
A SURVEY OF SOME SPECIES OF ASPERGILLUS AND PENICILLIUM FOR PRODUCTION OF AFLATOXINS AND KOJIC ACID.
Technical rept.,
by Frederick W. Parrish, Bonnie J. Wiley, Emory G.Simmons, and Louis Long,Jr.. Sep 65, 29p.
Rept. no. Microbiology series-20
Proj. 1A014501B71A03
Unclassified report

Descriptors: (*Kojic acid, Biosynthesis), (*Toxins + antitoxins, Biosynthesis), (*Molds (Organisms), Biological products), (*Penicillium (Penicillins), Biological products), Selection, Reviews, Biological assay, Chemical properties, Culture medium, Chemical analysis, Purification, Fungi

A total of 165 fungus strains representing 14 species of Aspergillus and 7 species of Penicillium were screened for production of aflatoxins and kojic acid in a defined medium. Aflatoxins were obtained only from two of the species of Aspergillus and from none of the species of Penicillium examined. Kojic acid was of more general occurrence, being obtained from strains of 9 species of Aspergillus and of 4 species of Penicillium. (Author)

AD-623 380 Div. 16/2 ,16/3
MEDICAL RESEARCH COUNCIL OXFORD (ENGLAND) CELL METABOLISM RESEARCH UNIT
MICROBIAL GROWTH ON C-1 COMPOUNDS. 6. OXIDATION OF METHANOL, FORMALDEHYDE AND FORMATE BY METHANOL-GROWN PSEUDOMONAS AM 1,
by Patricia A. Johnson, and J. R. Quayle. 31 Mar 64, 10p. Contract AF EOAR62 45 AFOSR , 65-1580
Unclassified report

Pub. in Biochemical Journal (Gt. Brit.) v93 p281-90 1964 (Copies available only to DDC users). See also AD-612 241.

Descriptors: (*Pseudomonas, Growth), (*Culture medium, Carbon compounds), (*Alcohols, Metabolism), (*Formaldehyde, Metabolism), (*Formates, Metabolism), Bacteria, Oxidation, Bacterial extracts, Catalysis, Antimetabolites, Oxidoreductases, Nucleotides, Reaction kinetics, Catalase

The complete oxidation of methanol to carbon dioxide in cell-free extracts of methanol-grown Pseudomonas AM 1 was investigated. By using 3-amino-1,2,4-triazole, a known inhibitor of catalase, the independence of methanol oxidation from catalatic activity was shown. The only enzyme capable of oxidizing methanol that could be demonstrated was a dehydrogenase that can be linked to phenazine methosulphate and required the presence of NH4 (+) ions. An aldehyde dehydrogenase that reduced 2,6-dichlorophenol-indophenol or phenazine methosulphate in the presence of formaldehyde was found in cell-free extracts and was purified. A nicotinamide-adenine nucleotidelinked formate dehydrogenase was found in cell-free extracts and purified. The possible significance of these enzymes in the oxidation of C-1 substrates by intact cells is discussed. Cell-free extracts of methanol-grown Protaminobacter ruber, Pseudomonas extroquens and Pseudomonas methanica have been found to possess a methanol dehydrogenases similar to those found in Pseudomonas AM 1. A specific nicotinamide-adenine dinucleotidelinked formaldehyde dehydrogenase was found in high activity in extracts of methanol-grown Pseudomonas methanica, in lower activity in extracts of methanolgrown Pseudomonas extorquens and Protaminobacter ruber.

AD-623 477 Div. 16/2
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
THE ROLE OF NACL IN THE LYSIS OF STAPHYLOCOCCUS AUREUS BY LYSOSTAPHIN,
by C. A. Schindler. 7 Apr 65, 8p.
Unclassified report

Pub. in J. Gen. Microbiol. v40 p199-205 1965 (Copies available only to DDC users).

Descriptors: (*Staphylococcus aureus, Degradation), Sodium compounds, Chlorides, Viability, Glycoproteins, Cell wall, Salts, Chemical analysis, Amino acids, Preparation, Purification

Lysostaphin attacked both viable staphylococci and the mucopeptide portion of the staphylococcal cell wall. In the absence of salts, lysostaphin activity could only be recovered from the particulate portion of the lysed cell after centrifugation, whereas in the absence of salts its action on the mucopeptide resulted in a recovery of active material in both the sediment and the supernatant fluid. It appears from these observations that lysostaphin is complexed with its substrate and that NaCl is required to break the complex. (Author)

AD-623 504 Div. 16/2
NORTHWESTERN UNIV CHICAGO ILL DEPT OF MICROBIOLOGY
EXTRACTION OF CELL-WALL POLYSACCHARIDE ANTIGEN FROM STREPTOCOCCI,
by Hutton D. Slade. 23 Apr 65, 7p. Contract NIH H03709
Unclassified report

Pub. in Journal of Bacteriology v90 n3 p667-72 Sep 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Max-Planck Institut fur Immunbiologie, Freiburg (Germany).

Descriptors: (*Streptococcus, Antigens + antibodies), Cell wall, Polysaccharides, Solvent extraction, Enzymes, Chemical analysis, Chromatographic analysis, Immunology

The carbohydrate grouping antigens in the cell walls of streptococci belonging to groups A, E, G, L, and T were extracted with 5% trichloroacetic acid at 90C. The antigens were removed also from dry whole cells by extraction with trichloroacetic acid followed by treatment with phenol-water. Details of the methods are presented. The antigens obtained by use of either of these procedures were suitable for studies on immunological specificity and chemical structure. Quantitative enzymatic and chemical analyses of two group E antigens and one group T preparation showed the presence of L-rhamnose (22 to 44%), D-glucose (7 to 22%), D-galactose (T antigen only, 26%), glucosamine (2 to 16%), and galactosamine (T antigen only, 3%). In addition, analyses of A and G antigen preparations are presented. The protein and phosphate content of the A and E antigens were about 1% each. Quantitative precipitin curves of these antigens are presented. (Author)

AD-623 690 See Fld. 6/16

AD-623 693 See Fld. 6/16

6/15. PHARMACOLOGY

AD-623 321 Div. 16/11,10/6
CFSTI Prices: HC $2.00 MF $0.50
INTERNATIONAL BIO-RESEARCH INC ST LOUIS MO
SCREENING OF NEW CHELATING AGENTS FOR BERYLLIUM.
Final rept. for Jun 64-Mar 65,
by Wolfgang Sterner, and L. E. Loveless. Aug 65, 31p. Contract AF33 615 1804 Proj. 6302 Task 630202
AMRL , TR-65-135

Unclassified report

Descriptors: (*Beryllium, Metal poisoning), (*Metal poisoning, Therapy), Amines, Carboxylic acids, Polymers, Chemical precipitation, Ethylenedintrilo tetraacetates, Phosphoric monoester hydrolases, Inhibition, Lethal dosage, Rats, Selection, Solid propellants, Toxicity

Thirteen polyaminopolycarboxylic acid chelating agents were evaluated in vitro and in vivo as potential therapeutic agents for acute beryllium poisoning. In the in vitro test system the ability of the chelating agent to reverse beryllium induced inhibition of alkaline phosphate was measured. In the in vivo system, the chelating agent was evaluated by its ability to prevent mortality of rats that had received an acute lethal dose of beryllium sulfate. None of the polyaminopolycarboxylic acids reversed completely the inhibition of alkaline phosphatase at either 35 percent or 65 percent levels of inhibition. All compounds were ineffective in overcoming the toxic dose of beryllium in rats. (Author)

AD-623 376 Div. 16/11,16/1
LUND UNIV (SWEDEN) DEPT OF PHARMACOLOGY
PRESYNAPTIC ACTION OF HEMICHOLINIUM AT THE NEUROMUSCULAR JUNCTION,
by D. Elmqvist, and D. M. J. Quastel. 23 Sep 64, 22p. Contract AF EOAR12 63 Proj. 9777 Task 977701
AFOSR , 65-1581

Unclassified report

Pub. in Journal of Physiol. v177 p463-82 1965 (Copies available only to DDC users).

Descriptors: (*Neuromuscular transmission, Cholines), (*Cholines, Neuromuscular transmission, Acetylcholine, Inhibition, Synthesis, Nerve cells, Nervous system, Physiology, Muscles, Ganglia, Stimulation, Potassium, Ions, Drugs, Sweden

By the use of intracellular electrodes a presynaptic effect of HC-3, hemicholinium no. 3, was shown at the mammalian neuromuscular junction. This effect was demonstrable only when the transmitter was released from the motor nerve terminals at a high rate and consisted of a progressive decline in the size of the miniature end-plate potentials and in the quantal components of the end-plate potentials as the transmitter was released. Releasing the transmitter by nerve stimulation or by increased potassium ion concentration were equally effective in eliciting the phenomenon. Post-synaptic chemosensitivity as measured by bath application of carbachol was the same before and after the quantal units had become small as a consequence of stimulation of transmitter release in the presence of HC-3. The effect is attributed to an inhibition of ACh synthesis by HC-3, the quanta becoming smaller in size as the presynaptic stores of ACh become depleted. It is suggested that the amount of releasable ACh in the motor nerve terminals can be estimated from the sum of all end-plate potentials and/or miniature end-plate potentials that can be elicited after blockade of ACh synthesis. (Author)

AD-623 378 Div. 16/11,28/1
PISA UNIV (ITALY) ISTITUTO DI FARMACOLOGIA
ELECTROCORTICAL CORRELATES OF AVOIDANCE CONDITIONING IN THE MONKEY AND THEIR MODIFICATIONS WITH ATROPINE AND AMPHETAMINE,
by G. F. Ricci, and L. Zamparo. 1965, 17p. Contract AF EOAR62 102
AFOSR , 65-1545

Unclassified report

Pub. in Pharmacology of Conditioning, Learning and Retention, Proceedings of International Pharmacological Meeting (2nd), Prague 20-23 Aug 1963 (Copies available only to DDC users).

Descriptors: (*Conditioned reflex, Cerebral cortex), (*Atropine, Electroencephalography), (*Amphetamines, Electroencephalography), (*Electroencephalography, Conditioned reflex), Behavior, Central nervous system, Motor reactions, Parasympatholytic agents, Parasympathomimetic agents, Sympatholytic agents, Monkeys

The results of the experiments indicate that in the monkey the impairment of the acquisition and of the retention of a conditioned avoidance response caused by atropine is related to the changes of electrocortical activity and of cortical excitability caused by the drug. The impairment of behaviour and the modifications of the cortical evoked responses induced by this anticholinergic drug are, however, effectively counteracted by enhancing the activity of the adrenergic system by means of amphetamine, while the effects of the EEG rhythms caused by atropine are not modified.

AD-623 381 Div. 16/11,16/1
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
EFFECT OF TYRAMINE, RESERPINE AND COCAINE ON THE NORADRENALINE RELEASE AND UPTAKE OF THE PERFUSED RABBIT KIDNEY,
by A. Inouye, and I. Tanaka. 24 Mar 64, 7p. Contract AF EOAR62 14 Proj. 9777 Task 977701
AFOSR , 65-1540

Unclassified report

Pub. in Acta Physiol. Scand. v62 p359-63 1964 (Copies available only to DDC users).

Descriptors: (*Levarterenol, Kidneys), (*Kidneys, Drugs), Reserpine, Local anesthetics, Epinephrine, Synthesis, Rabbits, Sweden

Perfusion of isolated rabbit kidneys for 120-150 min with Tyrode solution containing 0.05% iproniazide caused no change of the normal noradrenaline (NA) content. Addition of NA to the perfusion fluid caused an uptake of NA approximately proportional to the NA concentration. The major part of the NA retained was removed by subsequent perfusion with NA-free Tyrode solution. Perfusion with tyramine 0.0001 m removed a large part of the renal NA, even in the presence of NA in the perfusion fluid. Reserpine 0.000004 m did not significantly release NA or alter the renal NA content, but diminished the NA uptake from a solution containing NA. Cocaine caused a moderate release of NA and partially prevented the NA uptake while it hardly caused any loss in the renal NA content, suggesting some NA resynthesis. (Author)

AD-623 481 Div. 16/11,16/10
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
CLINICAL PATHOLOGICAL CORRELATIONS IN SQUIRREL MONKEYS AFTER SUPPRESSION OF SEMICIRCULAR CANAL FUNCTION BY STREPTOMYCIN SULFATE.
Research rept.,
by Makoto Igarashi, Michael E. McLeod, and Ashton Graybiel. Jul 65, 39p. Rept. no. NSAM-940
Proj. nasa order R93
NAVMED , MR005.13-6001-1-117

Unclassified report

Descriptors: (*Vestibular apparatus, Streptomycins), (*Streptomycins, Vestibular apparatus), (*Semicircular canals, Streptomycins), Pathology, Ear, Musculoskeletal system, Diseases, Emesis, Dosage, Thresholds (Physiology), Toxicity, Monkeys

Streptomycin sulfate was injected to eight selected squirrel monkeys in sufficient dosage to cause suppression of canal function as indicated by the threshold caloric test, emesis in the Slow Rotation Room, and ataxia. The animals were sacrificed six months after the suppression and slides for light-microscopic investigation were prepared following the standard temporal bone preparation procedure. Pathological findings were confined largely to the cristae and organ of Corti, which were both involved in almost every case. Only very slight changes were observed in the maculae in a few instances; therefore, this drug has a place in vestibular studies requiring selective suppression of canal function. The clinical tests used were not reliable indicators of the pathophysiological state of the cristae but were fairly reliable indicators of normal function of these organs. With regard to emesis in the SRR and ataxia, the essentiality of normal function of the semicircular canals has been demonstrated. No such essentiality was demonstrated for the otolith organs in the present investigation. (Author)

AD-623 490 Div. 16/11,16/3 ,16/1
NAVAL MEDICAL RESEARCH INST BETHESDA MD PHYSICAL BIOCHEMISTRY DIV
SOME STRUCTURAL REQUIREMENTS UNDERLYING HOLOTHURIN A INTERACTIONS WITH SYNAPTIC CHEMORECEPTORS,
by S. L. Friess, R. C. Durant, J. D. Chanley, and T. Mezzetti. 26 Feb 65, 12p. Proj. NR107 613

NAVMED , MR005.06-0010.01

Unclassified report

Pub. in Biochemical Pharmacology (Gt. Brit.) v14 p1237-47 (Copies available only to DDC users). Prepared in cooperation with Mount Sinai Hospital, New York. Chemistry Dept.

Descriptors: (*Toxins + antitoxins, Molecular properties), (*Nerve cells, Chemoreceptors), (*Chemoreceptors, Toxins + antitoxins), (*Cholinesterase inhibitors, Toxins + antitoxin), Physostigmine, Parasympathomimetic agents, Nerve impulses, Inhibition, Carboxylic ester hydrolases, Molecular structure, Glycosides

Studies involving the interactions of the crystalline neurotoxin holothurin A with the rat phrenic nervediaphragm preparation demonstrated that an irreversible destruction of the indirectly elicited twitch response can be largely negated by preincubation of the preparation with tiny concentrations of the representative anticholinesterases physostigmine, neostigmine, or galanthamine. This protective action is afforded by concentrations of the anti-acetylcholinesterase agents distinctly below those required to elicit blockade of the tissue-localized esterase, but still in a potency sequence that is roughly proportional to their anticholinesterasic strengths in vitro. Although a chromatographically pure component of the original mixture possesses essentially the same specific activity at the loci controlling nerve-stimulated twitch events as the mixture itself, and the loss of two sugar residues at carbon-3 affects the activity picture only moderately, the loss of the halfesterified sulfate function results in an abrupt decrease in blocking potency to virtually the zero level. (Author)

AD-623 497 Div. 16/11,28/1
CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST
COMPUTER ANALYSIS OF HIPPOCAMPAL EEG ACTIVITY AND IMPEDANCE IN AP-

PROACH LEARNING: EFFECTS OF PSYCHOTOMIMETIC AND HALLUCINOGENIC DRUGS,
by W. R. Adey. 1963, 31p. Contract AF AFOSR61 81 ,PHS B1883 AFOSR , 65-1572

Unclassified report

Pub. in Pharmacology of Conditioning, Learning and Retention. Proceedings of the International Pharmacological Meeting (2nd), Prague, 20-23 Aug 1963 (Copies available only to DDC users).

Descriptors: (*Learning, Electroencephalography), (*Psychotropic agents, Behavior), Brain, Hallucinogens, Lysergic acids, Data processing systems, Computers, Cats

AD-623 631 Div. 16/11,16/12
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTO DE NEUROLOGIA MONTEVIDEO (URUGUAY)
EFFECTS OF PSYCHOPHARMACOLOGIC DRUGS UPON SENSORY INFLOW IN NORMAL SUBJECTS, PSYCHIATRIC PATIENTS AND IN ANIMALS.
Final technical rept. for 1 Oct 64-30 Sep 65,
by Elio Garcia Austt. Sep 65, 16p. Contract DA ARO49 092 64G40 Proj. DA2N014501B71D

Unclassified report

Descriptors: (*Psychotropic agents, Sensory perception), (*Psychoses, Psychotropic agents), Barbiturates, Lysergic acids, Neuroses, Neurology, Physiology, Psychiatry, Drugs, Electroencephalography, Visual perception, Data processing systems, Rats, Guinea pigs, Cats

The objectives of the research were: (1) To establish changes observed in sensory evoked potential in normal subjects by barbiturates, lysergic acid, other psychotropic drugs in different attentional levels and during habituation and conditioning. (2) To determine the changes evoked in psychotic patients, especially schizophrenics. (3) To observe the effect of these drugs on attention, habituation, and conditioning in rat, guinea pig, and cat. In the first year a beginning was made on objectives 1 and 2 adding sensory information on comatose and stuporous patients. The CAT computer system was modified to automate recording procedures allowing accumulation for present time, readout, erase and reset without operator action. Study of drug action was begun with LSD-25 on visual sensory inflow. Results: (1) Multiplication of waves, particularly first components, (2) Increase in amplitude, particularly last components. Experiments with drugs on neurotic and psychotic patients are not yet definitive. Changes of VER in coma pattern of response are similar to that of newborn infant; in stuporous subject changes were observed indicative of change in level of awareness. (Author)

AD-623 335 **See Fld. 6/13**

AD-623 346 **See Fld. 6/16**

AD-623 347 **See Fld. 6/16**

AD-623 348 **See Fld. 6/16**

AD-623 349 **See Fld. 6/16**

AD-623 350 **See Fld. 6/16**

AD-623 368 **See Fld. 6/3**

AD-623 369 **See Fld. 6/3**

AD-623 373 **See Fld. 6/16**

AD-623 374 **See Fld. 6/16**

AD-623 375 **See Fld. 6/1**

AD-623 377 **See Fld. 6/16**

AD-623 502 **See Fld. 15/2**

AD-623 700 **See Fld. 6/16**

6/16. PHYSIOLOGY

AD-623 108 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
ANTIBODY PLAQUE-FORMING CELLS: KINETICS OF PRIMARY AND SECONDARY RESPONSE,
by J. S. Hege, and L. J. Cole. 2 Sep 65, 32p.
Rept. no. USNRDL-897
NAVMED , MR005.08-1200.2

Unclassified report

Descriptors: (*Antigens + antibodies, Spleen), (*Antigen-antibody reactions, Mathematical models), Immunology, Cells (Biology), Hemolysis, Erythrocytes, Globulins, Immune serums, Immunity, Reaction kinetics

Numbers of Jerne plaque-forming cells per spleen, serum hemolysin concentrations, and the degree of resistance of the serum hemolysin to degradation by 2-mercaptoethanol have been determined in adult CBA and C3D2F1 mice as functions of time following primary or secondary intravenous sensitization with 4 x 10 to the 8th power sheep erythrocytes. The characteristic secondary response yields fewer PFC and lower serum antibody concentrations than the primary response. When an adequate time interval (9 weeks or more) elapses between primary and secondary antigen injections, the magnitude of the secondary response begins to approach that of the primary. Primary serum hemolysin is mercaptoethanol sensitive (19S immunoglobulin) while secondary serum hemolysin is largely mercaptoethanol resistant (7S immunoglobulin). Generation times of 7 and 9 hours are obtained for plaque-forming cells during the first 4 days of the primary response. A mathematical model is presented which relates numbers of antibody forming cells to serum hemolysin concentrations. Using the model, together with available experimental data, it is concluded that the great majority of the cells producing 7S hemolysin probably are not detected by the Jerne technique, as applied to the spleen. (Author)

AD-623 126 Div. 16/1 ,28/1 ,16/3 ,28/4 ,+
CFSTI Prices: HC $4.00 MF $0.75
SYSTEMS RESEARCH LABS INC DAYTON OHIO
INTEGRATED DATA COLLECTION, MONITORING, CONVERSION, AND ANALYSIS SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS RESEARCH.
Final rept. for 1 Jul 61-31 Dec 63,
by D. H. Brand, R. M. Linhart, and C. A. Burns. Jun 65, 106p. Contract AF33 657 9810 Proj. 7222 Task 722201
AMRL , TDR-64-64

Unclassified report

Descriptors: (*Stress (Physiology), Data processing systems), (*Stress (Phychology), Data processing systems), (*Data processing systems, Psychophysiology), Physiology, Medical examination, Biochemistry, Blood chemistry, Adaptation (Physiology), Reaction (Psychology), Psychometrics, Programming (Computers), Programming languages, Analog-todigital converters, Factor analysis, Statistical analysis

The details involved in designing and executing a large-scale psychophysiological stress experiment are summarized. Design criteria and changes in experimental processes necessitated by preliminary, concurrent studies as well as instrumentation and data conversion problems are also presented. Emphasis is placed on description of the data processing routes, each of which consisted of analog tape formating, analog to digital conversion, data reduction and editing, and data analysis techniques. Flow diagrams, computer program writeups, and examples of pictorial output formats for general, automatic, biological data handling utility are appended. (Author)

AD-623 163 Div. 16/1
CFSTI Prices: HC $3.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
WEIGHTLESSNESS SIMULATION USING WATER IMMERSION TECHNIQUES: AN ANNOTATED BIBLIOGRAPHY,
by Helen M. Abbott, and John H. Duddy. Jul 65, 55p. Rept. no. 5-24-65-3 ,SB-65-2

Unclassified report

Descriptors: (*Weightlessness, Simulation), Bibliographies, Underwater, Space medicine, Humans, Stress (Physiology), Acceleration tolerance, Impact shock, Human engineering, Stress (Psychology)

The compilation contains 97 selected references pertaining to biomedical and behavioral research involving immersion of human subjects. The references are organized under three principal topics: (1) Physiological Studies, including acceleration, impact protection and physiological responses to weightlessness simulations, (2) Human Engineering Studies, and (3) Techniques and Personal Equipment Requirements for immersion studies. The references are arranged alphabetically by author or title under each separate topic. An Author Index is included as an aid in locating specific investigators and publications. The references cited are considered to be the principal contributions to the literature during the period from 1951 through 1965, including both open and government sources. (Author)

AD-623 181 Div. 16/1
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
ON 'INCOMPLETE' ANTI-RH ANTIBODIES: MECHANISM OF DIRECT AGGLUTINATION INDUCED BY MERCAPTOETHANOL,
by W. J. Mandy, H. H. Fudenberg, and F. B. Lewis. 28 Apr 65, 10p. Contract Nonr365612 Grant ,PHS HE05997 Proj. NR105 308

Unclassified report

Pub. in Journal of Clinical Investigation v44 n8 p1352-61 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Antigens + antibodies), (*Antigens + antibodies, Blood groups), (*Erythrocytes, Antigens + antibodies), Immune serums, Sensitivity, Gamma globulin, Electrophoresis

The direct agglutination of RH=POSITIVE ERYTHROCYTES PRODUCED BY THE SIMULTANEOUS ADDITION OF MERCAPTO = ETHANOL AND 'INCOMPLETE' ANTI =Rh antibody appears to be produced by mechansims other than changes in the tertiary structure of the molecules. Data obtained in experiments with isolated 7 S gamma-globulin from anti-Rh sera and mercaptoethanol-treated red cells suggest that several processes are involved. These include the direct effect of mercaptoethanol on the red cell surface, mercaptoethanol-induced 'adhesiveness' of protein molecules, and sensitization of erythrocytes by incomplete antibody. The sero-

logical behavior of 'incomplete' antibodies in the presence of mercaptoethanol appears to be attributable to a nonspecific, nonimmunological phenomenon. (Author)

AD-623 200 Div. 16/1 ,15/2
CALIFORNIA UNIV BERKELEY
METHODS FOR COMPARING GROWTH TYPE CURVES,
by Paul G. Hoel. 1964, 15p. Contract AF AFOSR62 158
AFOSR , 65-1406

Unclassified report

Pub. in Biometrics v20 n4 p859-72 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Growth, Correlation techniques), (*Correlation techniques, Growth), Statistical analysis, Polynomials, Analysis of variance, Mathematical models, Mathematical analysis, Medical research, Errors

A familiar statistical problem arising in biological research is that of comparing a treated group with a control group of growing organisms. The problem is difficult (a) because a realistic regression model is seldom available and (b) because the observed variables taken over time are not statistically independent as required by classical regression models. The paper is concerned with studying certain aspects of these problems and consists essentially of three sections. The first section compares the efficiency of using only means of sets of observations with using a polynomial regression model. The second section considers a best unbiased test for a polynomial regression model and compares it with a recent nonparametric method introduced by Rao, under the assumption that the observations are sufficiently far apart in time to be treated as uncorrelated. The third section studies the magnitude of the type I error arising from using a polynomial regression model that ignores the correlation present in data.

AD-623 203 Div. 16/1
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
IMMUNOCHEMICAL PROPERTIES OF HUMAN GAMMA-A ISOHEMAGGLUTININ. I. COMPARISONS WITH GAMMA-G AND GAMMA-M GLOBULIN ANTIBODIES,
by Kimishige Ishizaka, Teruko Ishizaka, Evelyn H. Lee, and Hugh Fudenberg. 16 Dec 64, 13p. Contract Nonr365612 Grant ,PHS A1 04985

Unclassified report

Pub. in The Journal of Immunology v95 n2 p197-208 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Gamma globulin), (*Gamma globulin, Antigens + antibodies), Blood groups, Erythrocytes, Hemolysis, Sensitivity, Immune serums, Humans, Guinea pigs

Isohemagglutinins were detected in pure gamma Aglobulin (IgA), gamma M-globulin (IgM) and gamma Gglobulin (IgG) fractions of sera from normal and immunized human subjects. The anti-A isoagglutinin in the immune sera was associated with both polymer and monomer forms of IgA. On a weight basis, the polymer form IgA antibody and IgM antibody had comparable hemagglutinating activities. The hemagglutinating activity of the monomer form IgA antibody was lower than that of the polymer form antibody, but higher than that of IgG antibody. The hemagglutinating activity of both polymer and monomer forms of IgA isoagglutinins was markedly diminished by reduction and alkylation. In contrast to the IgG and IgM isoagglutinins, the IgA isoagglutinins did not hemolyze homologous red cells with either guinea pig or human C prime. The IgA isoagglutinin did not sensitize guinea pig skin for passive cutaneous anaphylaxis. (Author)

AD-623 212 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
UPPSALA UNIV (SWEDEN) INST OF PHYSIOLOGY
RESEARCH ON THE GENESIS OF ACTION POTENTIAL IN EXCITABLE TISSUES.
Final technical rept.,
by Torsten Teorell. 20 May 65, 34p. Contract AF EOAR64 33
AFOSR , 65-1487

Unclassified report

Descriptors: (*Tissues (Biology), Osmosis), (*Osmosis, Biophysics), Membranes (Biology), Electrolytes (Physiology), Ions, Ion exchange, Semipermeability, Transport properties, Cells (Biology), Erythrocytes, Cell wall, Blood vessels, Water, Pressure, Volume, Mathematical models, Sweden

Contents: Some new results concerning stable and unstable concentration profiles in fixed charge membranes; Pressure-volume relations in living cells in the electrohydraulic pressoreceptor analog; Ion fluxes in electro-convection systems; Analysis of the components of action potentials in terms of non-linear mechanics; The fixed membrane theory in flocculation phenomena; The mechanism of selectivity of the dextran gels. (Author)

AD-623 219 Div. 16/1
TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
THE EFFECT OF DIFFERING DEMANDS FOR BLOOD CELL PRODUCTION ON DNA SYNTHESIS OF HEMOPOIETIC COLONY-FORMING CELLS OF MICE,
by A. J. Becker, E. A. McCulloch, L. Siminovitch, and J. E. Till. 13 Oct 64, 14p. Contract DRB9350 14 ,NRC T1714

Unclassified report

Pub. in Blood v26 n3 p296-308 Sep 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with the Ontario Cancer Inst., Toronto.

Descriptors: (*Desoxyribonucleic acids, Hemopoietic system), (*Hemopoietic system, Desoxyribonucleic acids), Blood cells, Synthesis, Nucleosides, Liver, Spleen, Bone marrow, Chromatographic analysis, Toxicity, Transplantation, Regeneration, Mice, Canada

A technic capable of estimating the fraction of hemopoietic colony-forming progenitor cells in DNA synthesis in vivo has been described. The technic is based on the ability of tritiated thymidine to inhibit the growth of those colony-forming cells which, by virtue of their presence in the S-phase during a 20-minute incubation in vitro, in the presence of 500 microcuries/ ml. of H3TdR, have incorporated large amounts of the nucleoside. The method has been applied to transplanted colony-forming cells proliferating in spleens of heavily irradiated recipients as well as to cells from normal fetal liver, normal marrow, and normal spleen. In situations where the hemopoietic system is expanding (fetal liver and regenerating transplants), a large fraction, 40-65 per cent, of the stem cells are in DNA synthesis. In the steady-state situations (adult marrow and spleen), the fraction of cells in DNA synthesis is almost imperceptible using this technic. It is concluded that control mechanisms which govern the rate of hemopoiesis operate, at least in part, by altering the generative cycle of bloodforming progenitor cells. (Author)

AD-623 220 Div. 16/1 ,16/10
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
THE HETEROGENEITY OF RHEUMATOID FACTORS AND THE GENETIC CONTROL OF POLYPEPTIDE CHAINS OF GAMMA-GLOBULINS,
by E. C. Franklin, and H. H. Fudenberg. 1965, 6p. Contract Nonr365612 Grant ,PHS A5997 Proj. NR105 308

Unclassified report

Pub. in Annals of the New York Academy of Sciences v124 pt2 p873-8 30 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with New York Univ., N. Y. School of Medicine.

Descriptors: (*Rheumatic diseases, Immunology), (*Peptides, Genetics), (*Gamma globulin, Molecular properties), (*Genetics, Peptides), Immunology, Rheumatic diseases), Antigens + antibodies, Molecular structure, Polymers

Evidence is presented that most RF proteins are heterogeneous in their antigenic composition although occasional ones are homogeneous and thus resemble the paraproteins. Studies pointing out some of the difficulties encountered with currently available preparations of polypeptide chains in the genetic mapping of gamma-globulin are described. (Author)

AD-623 247 Div. 16/1 ,16/12
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
MODELLING OF AUDIOGENIC EPILEPSY OF RODENTS: SUMMARY OF DATA BASED ON SOVIET LITERATURE,
by G. V. Savinov, L. V. Krushinskii, D. A. Fless, and P. A. Valershtein. 24 Apr 64, 13p. Rept. no. AID-U-64-29
TT , 65-64458

Unclassified report

Trans. of Biologicheskie Aspekti Kibernetiki, Moscow, 1962 p92-103.

Descriptors: (*Epilepsy, Mathematical models), (*Central nervous system, Stress (Physiology)), Stimulation, Inhibition, Motor reactions, Thresholds (Physiology), Auditory signals, Parabiosis, Nonlinear systems, Oscillographs, Rodents, USSR

The object of the experiment was to utilize mathematical modeling in order to verify the laws underlying certain protective mechanisms used by the nervous system under stress of external stimulation. Reflex (audiogenic) epilepsy of rodents was selected for studying the interrelationship between stimulation and inhibition as elements of the protective mechanism used by the nervous system. The experiments were oriented toward auditory stimulation, and one of the protective mechanisms under study was that of parabiotic, or transthreshold stimulation.

AD-623 253 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
EFFECT OF A STRONG ELECTROMAGNETIC FIELD ON THE VASOMOTORICS
ATD Work assignment no. 78, task 9,
by S. Figar. 15 Oct 64, 7p. Rept. no. ATD-U-64-110
TT , 65-64464

Unclassified report

Trans. of Ceskoslovenska Fysiologie, v12 n5 316p 1963. Translations of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Electromagnetic fields, Cardiovascular system), High frequency, Nervous system, Electromagnetic waves, Blood vessels, Muscles, Cardiovascular diseases, Industrial medicine, Czechoslovakia

With the purpose of studying the effect of a high-frequency field on the nervous system, 34 persons (24 men and 10 women) working in an environment with strong sources of centimeter electromagnetic waves were examined plethysmographically. Vascular reactions were induced by stimulation in the standard combination: multiplication

by heart, electrical skin touch, audio stimulation (bell), deep breath. Vascular reactions on the fingers were recorded by an electrocapacitive plethysmograph (2 plethysmograms from the contralateral fingers + a pneumogram). The results support the opinion that registered deviations in vascular-tonus control are caused by a long-time action of a high-frequency field on the neuro-vascular system.

AD-623 266 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
ON THE ORIGIN OF SLOW WAVES OBSERVED IN INTRACELLULAR DERIVATION IN DIVERSE CEREBRAL STRUCTURES (SUR L'ORIGINE DES ONDES LENTES OBSERVEES EN DERIVATION INTRACELLULAIRE DANS DIVERSES STRUCTURES CEREBRALES),
by D. Albe-Fessard. 1960, 6p. Contract AF61 052 103
AFOSR , TN-60-1310

Unclassified report

Pub. in Comptes rendus des seances de la Societe de Biologie Seance v44 n1 p11-6 1960 (Copies available only to DDC users. Text in French.

Descriptors: (*Nerve impulses, Cerebral cortex), (*Cerebral cortex, Nerve impulses), Central nervous system, Brain, Nerve cells, Nervous system, Physiology, France

AD-623 267 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
NEUROPHYSIOLOGY, GLOBAL OR UNITARY RESPONSES OBSERVED IN THE CENTRAL MEDIAN OF THE THALAMUS IN THE AWAKENED CAT (NEUROPHYSIOLOGIE. RESPONSES GLOBALES OU UNITAIRES OBSERVEES DAND LE CENTRE MEDIAN DU THALAMUS CHEZ LE CHAT EVEILLE),
by M. Robert Courrier. 1958, 3p. Contract AF61 052 103
AFOSR , TN-60-1311

Unclassified report

Pub. in Neurophysiol v10 p1-3 1958 (Copies available only to DDC users).

Descriptors: (*Thalamus, Stimulation), Nervous system, Physiology, Brain, Adaptation (Physiology), Cats, France

AD-623 268 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
REFLEXES IN THE PYRAMIDAL SYSTEM OF THE CAT (MISE EN JEU REFLEXE DU SYSTEME PYRAMIDAL CHEZ LE CHAT),
by P. Buser, and Ph. Ascher. 1960, 44p. Contract AF61 052 103
AFOSR , TN-60-1312

Unclassified report

Pub. in Arch. Ital. Biol. v98 p123-64 1960 (Copies available only to DDC users). Text in French.

Descriptors: (*Reflexes, Brain), (*Brain, Reflexes), Cerebral cortex, Central nervous system, Vision, Hearing, Stimulation, Sensory perception, Cats, France

AD-623 269 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
ORGANIZATION OF AFFERENT PROJECTIONS TO THE MOTOR CORTEX OF THE CAT (DONNEES SUR L'ORGANISATION DES PROJECTION AFFERENTES AU NIVAEU DU CORTEX MOTEUR DU CHAT,
by P. Buser, and M. Imbert. 1959, 11p. Contract AF61 052 103
AFOSR , TN-60-1313

Unclassified report

Pub. in Anales de la Facultad de Medicina, Montevideo v44 n3-4 p220-9 1959 (Copies available only to DDC users). Text in French.

Descriptors: (*Cerebral cortex, Sensory perception), (*Sensory perception, Cerebral cortex), Motor reactions, Central nervous system, Vision, Hearing, Brain, Stimulation, Reflexes, Cats, France

By cortical recording with extracellular microelectrodes, projections from different sensory modalities (visual, auditory, somatic) were identified in the motor (pericruciate) area of the cat and their organization studied. These experiments were performed on fifty animals, either under deep chloralosane narcosis, or unanaesthetized (curarised preparations). It is shown that, on the pericruciate cortex, and in both experimental conditions, a dominant number of 'polyvalent' units may be found, activated by any of the tested sensory systems. This pattern is in sharp contrast with the one found in the more caudally lying somatic area I. A transition zone, whose characteristics are complex, may also be identified. Some functional implications of our results (reflex activation of the pyramidal system by sensory stimulations, relationships between somatic I and motor area), are discussed. (Author)

AD-623 270 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
MICROPHYSIOLOGICAL STUDY OF SENSORY PROJECTIONS IN THE POSTERIOR SUPRASYLVIAN CORTEX OF THE CAT (ETUDE MICROPHYSIOLOGIQUE DES PROJECTIONS SENSORIELLES AU NIVEAU DU CORTEX SUPRASYLVIEN POSTERIEUR CHEZ LE CHAT),
by M. Imbert. 5 Apr 61, 2p. Contract AF61 052 103
AFOSR , TN-60-1443

Unclassified report

Pub. in Journal de Physiolgie v52 p126-7 1960 (Copies available only to DDC users).

Descriptors: (*Cerebral cortex, Sensory perception), (*Sensory perception, Cerebral cortex), Brain, Stimulation, Central nervous system, Physiology, Cats, France

AD-623 271 Div. 16/1
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
VISUAL AND ACOUSTIC RESPONSES IN THE POSTERIOR VENTRO-MEDIAN COMPLEX OF THE CAT THALAMUS (RESPONSES VISUELLES ET ACOUSTIQUES AU NIVEAU DU COMPLEXE VENTROMEDIAN POSTERIEUR DU THALAMUS CHEZ LE CHAT.),
by M. Maurice Fontaine. 1960, 4p. Contract AF61 052 103
AFOSR , TN-60-1444

Unclassified report

Pub. in Clin. Neurophysiol v11 p1-3 1959 (Copies available only to DDC users). Text in French.

Descriptors: (*Thalamus, Reflexes), (*Sensory perception, Thalamus), Vision, Hearing, Central nervous system, Brain, Physiology, Cats, France

AD-623 272 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INCREASE IN THE EXTENSOR TONUS IN CATS WITH FULLY AND PARTIALLY EXCISED CEREBELLUM DURING WEIGHTLESSNESS,
by O. G. Gazenko, and R. A. Grigoryan. 20 Oct 65, 15p. Rept. no. FTD-TT-65-1554
TT , 65-64468

Unclassified report

Unedited rough draft trans. of Byulleten Eksperimentalnoi Biologii i Meditsiny (USSR) v60 n7 p7-12 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Fig. not fully legible. Copy is available for public sale.

Descriptors: (*Cerebellum, Motor reactions), (*Motor reactions, Weightlessness), (*Weightlessness, Motor reactions), Excision, Vestibular apparatus, Nerve cells, Muscles, Reflexes, Vision, Cats, USSR

AD-623 293 Div. 16/1
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
COMPARISON OF EFFECT OF ENVIRONMENTAL AND PREOPTIC COOLING ON PLASMA CORTISOL LEVELS,
by I. Chowers, H. T. Hammel, S. B. Stromme, and S. M. McCann. 20 Nov 63, 8p. Contract AF33 657 11103 Grant ,AF AFOSR62 133
AFOSR , 65-1511

Unclassified report

Pub. in The American Journal of Physiology v207 n3 p577-82 Sep 1964 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with John B. Pierce Foundation Lab., New Haven, Conn.

Descriptors: (*Adrenocorticotropic hormone, Secretion), Neurology, Endocrine glands, Temperature, Blood plasma, Blood vessels, Body temperature, Pituitary gland, Adrenal glands, Cooling, Physiology, Dogs

The acute exposure of dogs to an environmental temperature of 0 C evoked an elevation in plasma cortisol concentration which was apparent within 15 min and persisted for the 45 min of exposure. Gradual cooling of the environment over a 45-min period to a minimal temperature of 0 C failed to elevate plasma cortisol concentrations, although other compensatory mechansims such as cutaneous vasoconstriction were active. Acute lowering of preoptic temperature also evoked a rise in plasma cortisol concentrations associated with lowering of pinna and elevation of rectal temperature. In this case the response was transient; plasma cortisol levels began to fall after 15 min of cooling even though cutaneous vasoconstriction was maintained. The results are interpreted to mean that acute lowering of environmental or preoptic temperature can activate the pituitary-adrenal system. (Author)

AD-623 343 Div. 16/15,16/1
CALIFORNIA UNIV BERKELEY NEUROSENSORY LAB
THE SPATIAL PROPERTIES OF THE HUMAN ELECTRORETINOGRAM,
by G. S. Brindley, and G. Westheimer. 22 Jan 65, 22p. Contract Nonr22282 Grant ,N1H NB03154

Unclassified report

Pub. in Journal of Physiology v179 p518-37 1965 (Copies available only to DDC users).

Descriptors: (*Retina, Records), (*Medical examination, Analysis), Recording systems, Vision, Light

A technique was developed for recording the electroretinogram of any small region of the human retina. Responses to stray light and suppressed by steady illumination of the whole retina outside

the geometrical image of the stimulus. The technique is easily capable of detecting the blind spot, and of examining the electrical response to a stimulus of 2 degree diameter centered on the fixation point. For stimuli larger than several square degrees, the electroretinogram shows exact spatial additivity. On a finer scale it is at least roughly additive. The foveal electroretinogram differs in shape from the extrafoveal. The electroretinograms of different regions of the extrafoveal retina differ greatly one from another in their amplitude per unit area of retina, but little if at all in their shape. (Author)

AD-623 346 Div. 16/1 ,16/12,16/11
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
UTERINE MOTILITY OF THE ESTROGENIZED RABBIT. I ISOTONIC AND ISOMETRIC RECORDING IN VIVO. INFLUENCE OF ANESTHESIA AND TEMPERATURE,
by Johannes Setekleiv. 29 Jan 64, 11p. Contract AF EOAR62 36
AFOSR , 65-1574

Unclassified report

Pub. in Acta Physiol Scand. p1-11 1964 (Copies available only to DDC users).

Descriptors: (*Reproductive system, Physiology), (*Anesthesia, Reproductive system), (*Body temperature, Reproductive system), Recording system, Contraction, Stimulation, Nerves, Muscles, Thresholds (Physiology), Estrogens, Levarterenol, Barbiturates, Ethers, Spinal column, Anesthetics, Rabbits, Norway

A technique for isotonic and isometric recording of uterine contractions in vivo is described. No significant difference was found in the spontaneous contractions recorded simultaneously from the two horns by the two methods. On the other hand, differences were found in the responses to gradually increasing stimuli, such as increasing concentrations of noradrenaline or of increasing strength of stimulation of the hypogastric nerve. The isotonic response rapidly reached a maximum, whereas the isometric response increased more gradually. Since the isotonic response can be maximal in spite of submaximal activation, the isometric response is a more reliable quantitative measure, which is in agreement with previous findings with in vitro recording. However, for qualitative evaluation of responses near threshold stimulation, isotonic recording at low loads is preferable. Anesthetics administered i.v. in small doses to lightly anesthetized animals slightly enhanced uterine contractions, whereas deep anesthesia and local application of the anesthetics depressed the activity. Uterine mobility is extremely sensitive to decrease in body temperature. (Author)

AD-623 347 Div. 16/1 ,16/12,16/11
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
UTERINE MOTILITY OF THE ESTROGENIZED RABBIT. II. RESPONSE TO DISTENSION,
by Johannes Setekleiv. 29 Jan 64, 14p. Contract AF EOAR62 36
AFOSR , 65-1575

Unclassified report

Pub. in Acta Physiol Scand. p1-15 1964 (Copies available only to DDC users).

Descriptors: (*Reproductive system, Physiology), (*Anesthesia, Reproductive system), Contraction, Muscles, Rhythm (Biology), Volume, Pressure, Recording systems, Anesthetics, Local anesthetics, Spinal column, Atropine, Sympatholytic agents, Autonomic nervous system, Estrogens, Rabbits, Norway

The myometrial response to rapid distension consists of a quick contraction, the early stretch response, followed by an increase in the rhythmic activity. The latency and amplitude of the early contraction has been studied during increasing degrees of distension and during repetitive distensions. The frequency of the rhythmic contractions increases with increasing distension; the amplitude and the external work performed by each contraction at first increases and later decreases. Data obtained from isometric and isotonic recordings indicate that the pacemaker activity is not directly related either to the intra-uterine volume or to the intra-uterine pressure but rather to the tension in the myometrial cells. The independency with which the two horns respond to distension, the lack of effect of local and spinal anesthesia and of autonomic blocking agents indicates that the active response to distension is of myogenic origin. The intra-uterine pressure is not maintained during constant distension but decreases at first rapidly, later more slowly. (Author)

AD-623 348 Div. 16/1 ,16/12,16/11
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
UTERINE MOTILITY OF THE ESTROGENIZED RABBIT. III. RESPONSE TO HYPOGASTRIC AND SPLANCHNIC NERVE STIMULATION,
by Johannes Setekleiv. 19 Feb 64, 13p. Contract AF EOAR62 36
AFOSR , 65-1576

Unclassified report

Pub. in Acta Physiol. Scand. p1-13 1964 (Copies available only to DDC users).

Descriptors: (*Reproductive system, Physiology), (*Autonomic nervous system, Reproductive system), Nerves, Stimulation, Extremely low frequency, Contraction, Muscles, Rhythm (Biology), Local anesthetics, Atropine, Sympatholytic agents, Parasympathomimetic agents, Estrogens, Rabbits, Norway

The amplitude of the uterine contraction elicited by a few seconds stimulation of the hypogastric nerve depends on: (1) the stimulus frequency, the contraction being maximal at 30 to 50 cps; (2) the excitability of the myometrium, being increased in a period from 20 to 60 sec following a preceding stimulus, and; (3) the degree of uterine distension. Whereas stimulation for a few seconds elicits a single contraction, prolonged stimulation (for several minutes) at low frequencies (5-10 cps) evokes a series of rhythmic contractions. Prolonged stimulation at frequencies above 10 cps causes in addition a transient elevation of the minimum pressure. I. v. administration of cocaine does not potentiate the response to hypogastric nerve stimulation, whereas potentiation by cocaine is obtained when the agent are applied intra-uterinely. This effect, as well as the response to adrenergic blocking agents, indicate the presence of adrenergic fibres in the hypogastric nerve supplying the myometrium. Evidence for cholinergic fibres to uterus in the hypogastric nerve was not obtained. The uterine response to splanchnic nerve stimulation differs from the response to hypogastric nerve stimulation by a longer latency and by a more gradual onset. (Author)

AD-623 349 Div. 16/1 ,16/12,16/11
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
UTERINE MOTILITY OF THE ESTROGENIZED RABBIT. IV. REFLEX EXCITATION AND INHIBITION,
by Hohannes Setekleiv. 16 Mar 64, 9p. Contract AF AEOR62 36
AFOSR , 65-1577

Unclassified report

Pub. in Acta Physiol. Scand. p1-9 1964 (Copies available only to DDC users).

Descriptors: (*Reproductive system, Physiology), (*Autonomic nervous system, Reproductive system), Reflexes, Stimulation, Inhibition, Nerves, Muscles, Contraction, Rhythm (Biology), Cranial nerves, Adrenal glands, Sympatholytic agents, Estrogens, Rabbits, Norway

The uterus can be reflexly activated by stimulation of the rectum, various somatic nerves, and the central and peripheral ends of the cut vagus nerve. The initial uterine contraction is followed by a period of reduced rhythmic activity. Similar responses can be elicited by asphyxia and by clamping of the common carotid arteries. All these responses are due to activation of the sympathico-adrenal system. A transient inhibition of the 'spontaneous' rhythmic activity is obtained by electrical stimulation of the depressor nerve. Since it is abolished by sympathetic blocking agents, it is most likely due to a reduction of a sympathetic tonic influence. The results indicate that although the autonomy of the myogenic rhythmic uterine activity is strong in the estrogenized rabbit, it can be influenced by various reflexes. It is suggested that the sympathetic nervous system exerts a tonic influence on the uterus in vivo. (Author)

AD-623 350 Div. 16/1 ,16/12,16/11
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
UTERINE MOTILITY OF THE ESTROGENIZED RABBIT. V. RESPONSE TO BRAIN STIMULATION,
by Johannes Setekleiv. 16 Mar 64, 10p. Contract AF EOAR62 36
AFOSR , 65-1578

Unclassified report

Pub. in Acta Physiol. Scand. p1-10 1964 (Copies available only to DDC users).

Descriptors: (*Reproductive system, Physiology), (*Brain, Stimulation), Muscles, Contraction, Rhythm (Biology), Inhibition, Autonomic nervous system, Pituitary hormones, Cerebellum, Thalamus, Cerebral cortex, Estrogens, Rabbits, Norway

Uterine contractions were elicited by electrical stimulation of points located in the lateral parts of the medulla oblongata, whereas inhibitory responses were induced from the midline medullary region. Cerebellar stimulation determined an inhibition of the rhythmic uterine activity followed by a rebound effect, on cessation of the stimulation. From the hypothalamus three different responses were obtained: (i) excitatory effects from the perifornical, the dorsal, lateral and posterior hypothalamic areas due to sympathetic activation, (ii) uterine excitation by oxytocin liberation induced from the ventromedial part of the hypothalamus, and (iii) inhibition of the uterine rhythmic activity by stimulation of a restricted region in the lateral hypothalamic area. Excitatory responses were also evoked from the amygdala, from sensorimotor cortex, and the anterior limbic region. Inhibitory uterine responses were produced from the two cortical areas just mentioned as well as from the orbital surface. (Author)

AD-623 365 Div. 16/10,28/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
EVIDENCE FOR HUMORAL MEDIATION OF RADIATIONINDUCED MOTIVATION OBTAINED FROM PARABIONT RATS,
by E. L. Hunt, H. W. Carroll, and D. J. Kimeldorf. 25 Aug 65, 18p. Rept. no. USNRDL-TR-891
NAVMED , MR005.08-1200-1

Unclassified report

Descriptors: (*Radiation effects, Conditioned reflex), (*Conditioned reflex, Radiation effects), Behavior, Motivation, Learning, Parabiosis, X rays, Shielding, Reaction (Psychology), Rats

Parabiotic rat pairs with a skin-vascular anastomosis were used to test for a radiation-induced transferrable humoral factor which would motivate aversive conditioning in a non-irradiated (shielded) recipient. The shielded partner, by tasting saccharin-flavored fluid shortly after its partner was X-irradiated (360 R), was aversively conditioned to saccharin. This was interpreted as evidence for a humoral factor. (Author)

AD-623 367 Div. 16/1
BUENOS AIRES UNIV (ARGENTINA) INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA
5-HYDROXTRYPTAMINE RECEPTORS AND SYNAPTIC TRANSMISSION IN MOLLUSCAN NEURONES,
by H. M. Gerschenfeld, and E. Stefani. 1965, 6p. Contract AF AFOSR656 64
AFOSR , 65-1943

Unclassified report

Pub. in Nature v205 n4977 p1216-8 20 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Mollusca, Nervous system), (*Gastropoda, Nervous system), (*Nerve cells, Physiology), (*Serotonin, Nerve impulses), Amines, Alcohols, Chemoreceptors, Membranes (Biology), Acetylcholine, Enzymes, Biosynthesis, Ganglia, Lysergic acids, Argentina

The high 5-hydroxytryptamine (5-HT) mollusc ganglia (which is here confirmed for the Argentine land snail Cryptomphallus aspersa), the presence of enzymes for the synthesis and inhibition of 5-HT, the specific effects of the amine on the membrane conductance of cells with inhibition of long diration (CILDA), and the presence of specific 5-HT receptors on the membrane of the same neuron type fill some of the criteria required to consider the substance as a synaptic transmitter. The blocking of 5-HT receptor sites by lysergic acid diethylamide and by bromolysergic acid was confirmed on the cellular level with CILDA neurones. Additional evidence indicates that 5-HT may be the natural excitatory transmitter for these neurones.

AD-623 372 Div. 16/1
UPPSALA UNIV (SWEDEN) INST OF PHYSIOLOGY
THE ION FLUX ACROSS MEMBRANES DURING ELECTRO-DIFFUSION AND CONVECTION,
by Torsten Teorell. 1964, 4p. Contract AF EOAR33 64 ,NIH NB03712 03 Proj. 9777 Task 977701
AFOSR , 65-1552

Unclassified report

Pub. in Acta Physiologica Scandinavica v62 p293-4 1964 (Copies available only to DDC users).

Descriptors: (*Electrolytes (Physiology), Semipermeability), (*Membranes (Biology), Semipermeability), Ions, Osmosis, Equations, Sweden

Ion flux is considered across a membrane containing wide pores and separating 2 concentrations of a single salt. A formula for cation flux is derived for electro-diffusion and convection in the cases where forces present are due to (1) the concentration gradient, (2) the transmembrane potential gradient, and (3) the linear bulk flow velocity (V) through the membrane pores. The formula is valid whether the water streaming V is induced by a hydrostatic or an electroosmotic pressure difference across the membrane. (Author)

AD-623 373 Div. 16/1 ,16/11
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
UPTAKE AND EXCHANGE OF CATECHOLAMINES IN RATE TISSUES AFTER ADMINISTRATION OF D- AND 1-ADRENALINE,
by T. C. Westfall. 30 Jun 64, 8p. Contract AF EOAR31 64 ,PHS NB04432 02
AFOSR , 65-1551

Unclassified report

Pub. in Acta Physiologica Scandinavica v63 p336-42 1965 (Copies available only to DDC users).

Descriptors: (*Amines, Tissues (Biology)), Epinephrine, Levarterenol, Heart, Liver, Cells (Biology), Granules, Urine, Excretion, Rats, Sweden

The effect of d- and 1-adrenaline (A) on the catecholamine (CA) content of heart and liver of the rat was studied at various times following i.m. administration. It was observed that both isomers are readily taken up by these tissues and exchanged for the normal neurotransmitter, noradrenaline (NA). The present experiments also present evidence for the uptake of both d- and 1-A into subcellular storage granules. The fall in the NA content of the organs was accompanied by an increased urinary excretion of NA. The present experiments also indicate that there is a slight steric preference for the storage in favor of the 1-isomer. (Author)

AD-623 374 Div. 16/1 ,16/11
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
UPTAKE OF CATECHOLAMINES BY THE HEARTS OF RABBITS TREATED WITH SEGONTIN,
by B. R. Mackenna. 20 Jun 64, 10p. Contract AF EOAR32 64
AFOSR , 65-1550

Unclassified report

Pub. in Acta Physiol. Scand. v63 p413-22 1965 (Copies available only to DDC users).

Descriptors: (*Amines, Heart), Levarterenol, Epinephrine, Tissues (Biology), Parenteral infusions, Injection (Medicine), Sympatholytic agents, Rabbits, Sweden

A single i.v. injection of 8 mg/kg of Segontin caused a fall in the NA content of rabbit hearts to less than 10 per cent of their normal value in about 2 hrs. After 4 hrs the tissue content of NA started to rise again and after 24 hrs it had recovered to about one third of its normal value. An i.m. injection of 0.75 mg/kg NA 2 hrs after Segontin treatment, caused a temporary rise in the NA content of the heart to the normal value. NA was increased in the coarse particle fraction, the high speed sediment and in the particle free supernatant fraction of the heart after homogenization, indicating that the exogenous NA is temporarily filling the available storage sites. An i.v. infusion of NA (10 micrograms/kg/min for 20 min) caused an uptake of NA into the heart previously depleted by Segontin, followed by a rapid and then slower release of the NA. The uptake of 1-NA and d-NA and also of 1-A and d-A showed stereochemical specificity in favour of the 1-isomers. Phenoxybenzamine blocked the uptake of NA into the heart of rabbits depleted by Segontin, whereas DCI had only a small blocking effect. Phenoxygenzamine by itself reduced the NA content of all fractions of the heart. (Author)

AD-623 377 Div. 16/1 ,16/11,16/10
LUND UNIV (SWEDEN) DEPT OF PHARMACOLOGY
AN ELECTROPHYSIOLOGICAL INVESTIGATION OF NEUROMUSCULAR TRANSMISSION IN MYASTHENIA GRAVIS,
by D. Elmqvist, W. W. Hofmann, J. Kugelberg, and D. M. J. Quastel. 22 Apr 64, 20p. Contract AF EOAR12 63 Proj. 9777 Task 977701
AFOSR , 65-1548

Unclassified report

Pub. in Journal of Physiol. v174 p417-34 1964 (Copies available only to DDC users).

Descriptors: (*Neuromuscular transmission, Diseases), (*Acetylcholine, Neuromuscular transmission), Skeletal muscle relaxants, Muscles, Nerves, Stimulation, Contraction, Sweden

By the use of intracellular electrodes the neuromuscular transmission mechanism was studied in isolated intercostal muscle obtained from patients with myasthenia gravis. With repetitive nerve stimulation at frequencies above 2/sec, only the first few stimuli elicited muscle contractions in most fibers and then subthreshold endplate potentials, (epps) could be recorded. Miniature endplate potentials (mepps) had a mean amplitude 1/5 of the normal. The calculated size of the quantal components of epps corresponded closely to the mepp amplitude. Other observations made appeared normal, i.e., resting frequency of mepps, quantum content of epps, post-synaptic chemosensitivity with ACh analogs, input resistance, and resting membrane potential. It is tentatively concluded that in myasthenia gravis there is a deficiency in the amount of ACh in the quanta of transmitter released from the motor nerve terminals. (Author)

AD-623 379 Div. 16/1
FREIE UNIVERSITAET BERLIN (WEST GERMANY) PHYSIOLOGISCHES INSTITUT
DIURESIS INDUCED BY WATER INFUSION INTO THE CAROTID LOOP OF UNANAESTHETIZED DOGS,
by Joachim O. Arndt, and Otto H. Gauer. 8 Aug 64, 12p. Contract AF EOAR62 75
AFOSR , 65-1544

Unclassified report

Pub. in Pflugers Archiv v282 p301-12 1965 (Copies available only to DDC users).

Descriptors: (*Urine, Excretion), (*Water, Parenteral infusions), (*Parenteral infusions, Kidney function tests), Hormones, Arteries, Sense organs, Electrolytes (Physiology), Osmotic pressure, West Germany

In five unanaesthetized trained dogs the effect of injection of small quantities of water into a carotid loop on the excretion of urine was investigated. The infusion rates were 3.0, 2.5 and 2.0 ml/min. Infusion time was 30 min, so that a total of 90, 75 and 60 ml of water was injected. As controls, identical water infusions were made into a peripheral vein. The following results were obtained: Diuresis occurred only with intracarotid infusions. This speaks in favour of a central location of osmoreceptors. The diuresis was a function of the amount of water infused and was due solely to an increase in free water clearance. The excretion of electrolytes and the osmotic clearance remained unchanged. These findings can best be explained by the ADH mechanism. (Author)

AD-623 410 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
SAINT LOUIS UNIV MO DEPT OF PHYSIOLOGY
STUDIES ON CUTANEOUS HEAT LOSSES. PART I. A METHOD OF PARTITIONAL CALORIMETRY OF INDIVIDUAL SKIN AREAS.
Technical rept.,
by Alrick B. Hertzman, Walter C. Randall, Clarence N. Peiss, Helge E. Ederstrom, and Russel Seckendorf. Nov 51, 19p. Contract AF33 038 8585
AF , TR-6680 P1

Unclassified report

Descriptors: (*Skin, Temperature), Body temperature, Measurement, Calorimeters, Perspiration, Sweat cooling, Sweat glands, Evaporation, Temperature sensitive elements

A method of partitional calorimetry which is applicable to the measurement of the radiative, convective and evaporative heat losses from a limited skin surface (forehead, palm, thigh, etc) was based on measurements of skin and environmental temperatures and cutaneous evaporative rates. Radiation was calculated from the Stefan-Boltzmann equation; convection was estimated from the air insulation which in turn was approximated from the application of the diffusion equation to the evaporation of water. The local evaporative rates were measured by means of desiccating capsules. The sources of error are described. The total body loss-

es of heat via radiation and convection from the skin cannot be obtained from the sum of the weighted regional rates. For reasons given in the text, this is not a criticism of regional partitional calorimetry. Total cutaneous evaporation is closely approximated by the sum of the weighted regional rates. (Author)

AD-623 411 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
SAINT LOUIS UNIV MO DEPT OF PHYSIOLOGY
THE DERMATOMAL RECRUITMENT OF SWEATING IN RESPONSE TO GENERALIZED RADIANT HEATING.
Technical rept. on Studies on Cutaneous Heat Losses,
by Walter C. Randall, and Alrick B. Hertzman.
Nov 51, 21p. Contract AF33 038 8585
AF , TR-6680 P3

Unclassified report

Descriptors: (*Perspiration, Measurement), Sweat cooling, Heat tolerance, Sweat glands, Skin, Body temperature, Inhibition, Evaporation, Central nervous system, Temperature

A series of experiments was designed to study the sweating responses on the various body surfaces to a gradually rising environmental temperature. Sweating records were taken by means of the iodine-starch-paper technique on fourteen to seventeen different body regions which were selected to provide observations on as many different sensory dermatomes as possible. Sweating was commonly observed on the palmar and plantar surfaces even during control exposures at relatively cool environmental temperatures and at times when it was not present on any other test area. As the environmental temperature was slowly elevated and as sweating appeared on the distal portions of the lower extremity, sweating decreased frequently, although not always, on the palm and sole. In a few experiments, sweating continued on the palm and sole throughout the experiments but did not appear to be in any way related to the increasing environmental temperature.

AD-623 486 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR THE LIMACON,
by John A. Weaver. 30 Jun 65, 37p. Rept. no.
NADC-ML-6507
NAVMED , MR005.13-6002.5-3

Unclassified report

Descriptors: (*Vestibular apparatus, Motion), (*Stess (Phy'iology), Equations, Aviation (Medicine), Geometric forms, Vehicles, Simulation, Acceleration, Perception, Centrifuges, Space flight

Equations of motion for the limacon curve are developed for use in the study of vestibular function as related to vehicular motion. The equations are transformed from polar coordinate terms given in terms of the radius vector and the polar angle to circular motion terms given in terms of the radius of curvature and central angle of the circle of curvature. This permits comparison of vestibular function studies done in vehicles with those done on human centrifuges. Equations were derived for defining the accelerations of interest in studying vestibular effect on humans moving along the limacon. While conclusions are specific to the immediate program, basic approaches were developed for defining equations of the form rho = f (theta) in terms of circular motion. (Author)

AD-623 496 Div. 16/1
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
THIOGLYCOLLATE-STABLE LUTEINIZING HORMONE AND CORTICOTROPHIN-RELEASING FACTORS,
by V. D. Ramirez, and S. M. McCann. 30 Sep 63, 7p. Contract AF AFOSR62 133 ,NIH A1236C6 Proj. 9777 Task 97701
AFOSR , 65-1510

Unclassified report

Pub. in The American Journal of Physiology v207 n2 p441-5 Aug 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hormones, Secretion), Adrenocorticotropic hormone, Thalamus, Tissue extracts, Ascorbic acid, Ovaries, Cerebral cortex, Stabilization, Beef, Rats

Cruce acidic extracts of beef stalk-median eminence tissue depleted ovarian ascorbic acid on injection into immature rats pretreated with gonadotrophins. They also elevated plasma luteinizing hormone (LH) activity in ovariectomized rats which had been pretreated with both estrogen and progesterone. This activity could not be explained by possible LH contamination of the extracts. Since cerebral cortical extracts prepared similarly possessed little or no activity, it is concluded that beef stalk-median eminence tissue contains a specific LH-releasing factor (LH-RF). These same extracts possessed an ACTH-releasing action, as judged by adrenal ascorbic acid depletion induced in rats with median eminence lesions, which could not be accounted for by the minimal contamination of the extract with ACTH itself. Thioglycollate failed to alter either the LH or ACTH-releasing activities of these extracts under conditions which markedly reduce the activity of Pitressin. It is concluded that the LH-RF and corticotrophinreleasing factor resident in beef hypothalamic tissue are dissimilar from the known neurohypophysial polypeptides. (Author)

AD-623 499 Div. 16/1
INSTITUTO VENEZOLANO DE INVESTIGACIONES CIENTIFICAS CARACAS DEPARTAMENTO DE BIOFISICA
SODIUM EXTRUSION AND POTASSIUM UPTAKE IN GUINEA PIG KIDNEY CORTEX SLICES,
by Guillermo Whittemburg. 30 Oct 64, 22p.
Contract AF AFOSR620 64 ,AF AFOSR61 85
Proj. 9777 Task 977701
AFOSR , 65-1516

Unclassified report

Pub. in The Journal of General Physiology v48 n4 p699-717 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Kidneys, Semipermeability), (*Electrolytes (Physiology), Semipermeability), Sodium, Potassium, Ions, Transport properties, Electrodialysis, Membranes (Biology), Tissues (Biology), Venezuela

Slices from the cortex corticis of the guinea pig kidney were immersed in a chilled solution without K and then reimmersed in warmer solutions. The Na and K concentrations and the membrane potential V sub m were then studied as a function of the Na and K concentrations of the reimmersion fluid. It was found that Na is extruded from the cells against a large electrochemical potential gradient. Q sub 10 for net Na outflux was approx. 2.5. At bath K concentrations larger than 8 mm, the behavior of K was largely passive. At the outset of reimmersion (V sub M > E sub K), K influx seemed secondary to Na extrusion. Na extrusion would promote K entrance, being limited and requiring the presence of K in the bathing fluid. At bath K concentrations below 8 mm, K influx was up an electrochemical potential gradient. Thus a parallel active K uptake is apparent. Q sub 10 for net K influx was approx. 2.0. Dinitrophenol inhibited net Na outflux and net K influx, Q sub 10 became <1.1 for both fluxes. The ratio between these fluxes varied. Thus at the outset of reimmersion the net Na outflux to net K influx ratio was >1. After 8 min it was <1. (Author)

AD-623 535 Div. 16/1 ,16/10
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF MICROBIOLOGY
TOTAL MASS AND IRON CONTENT DETERMINATION OF HEMOSIDERIN GRANULES BY QUANTITATIVE ELECTRON MICROSCOPY,
by Gastone T. Matioli, Gunter F. Bahr, Elmar Zeitler, and Richard F. Baker. 8 Dec 64, 7p. Contract PHS AM08197 ,PHS HE07976

Unclassified report

Pub. in Journal of Ultrastructure Research, v13 p85-91 1965. (Copies available only to DDC users).

Descriptors: (*Hemoglobin, Electron microscopy), Iron, Ferritin, Cells (Biology), Granules, Erythrocytes, Hemopoietic system, Synthesis, Blood disorders

The total mass and iron content of in vitro prepared hemosiderin granules have been determined by quantitative electron microscopy. Good agreement has been obtained between the measured values and the values calculated for spherical particles of hemosiderin composed of closely packed molecules of ferritin. The results can be used to evaluate the iron bound to hemosiderin in single cells. It appears that in some diseases, like thalassemia, erythropoietic cells contain more iron than is actually needed for hemoglobin synthesis, suggesting the existence, in these cells, of a competition between ferritin and hemoglobin for free iron. (Author)

AD-623 538 Div. 16/1 ,16/3
MICHIGAN UNIV ANN ARBOR CELLULAR BIOCHEMISTRY LAB
DIFFERENTIALLY LOCALIZED INCORPORATION OF AMINO ACIDS IN RELATION TO EPIDERMAL KERATINIZATION IN THE NEWBORN RAT,
by Kimie Fukuyama, Toshio Nakamura, and I. A. Bernstein. 1964, 11p. Contract Nonr122435 Proj. NR105 223

Unclassified report

Pub. in the Anatomical Record, v152 n4 p525-36 Aug 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Skin, Amino acids), (*Amino acids, Skin), Methionine, Phenylalanine, Proteins, Autoradiography, Nuclei (Biology), Cytoplasm, Cells (Biology), Labeled substances, Integumentary system, Rats

Incorporation of tritiated methionine, phenylalanine, leucine, glycine and histidine into protein in the epidermis of the newborn rat was studied by autoradiography. Methionine, phenylalanine and leucine behaved similarly. Thirty minutes after injection, radioactivity was detected in both nucleus and cytoplasm of the basal, spinous and granular cells with a greater intensity over the cells of the lower layer as compared with that observed over the upper layer. The label appeared over the cornified cells at 24 hours after injection probably as a result of the migration of cells into the cornified layer. In the case of glycine and histidine, the label was detected in each of the three layers at 30 minutes after injection but the labeling was higher in the upper part of the epidermis as compared with the lower part. The label appeared in the cornified layer six hours after injection. Processes possibly involved in formation of the cornified layer are discussed. (Author)

AD-623 578 Div. 16/10
CFSTI Prices: HC $3.00 MF $0.75
PUBLIC HEALTH SERVICE WASHINGTON D C DIV OF HEALTH MOBILIZATION
HEAT SYNDROME DATA FROM SELECTED HOSPITAL RECORD SURVEY.
Final rept.
1965, 89p. Contract OCD OS62 100 Task 1221A

Unclassified report

Descriptors: (*Heat tolerance, Statistical analysis), Aging (Physiology), Cardiovascular system, Civil defense systems, Climatology, Disasters, Epidemiology, Hospitals, Humidity, Louisiana, Medical personnel, Shelters, Stress (Physiology), Survival

Statistical analysis of heat syndrome causes, both environmental and human factors, with preventive and alleviating suggestions for civil defense shelters and similar situations. Useful base for clinical evaluation, for physicians and other medical personnel in emergency situations. (Author)

AD-623 599 Div. 16/10
CFSTI Prices: HC $2.00 MF $0.50
USAF RADIATION LAB UNIV OF CHICAGO ILL
THE EFFECTS OF IONIZING RADIATIONS ON THE BIOCHEMISTRY OF MAMMALIAN TISSUES.
Quarterly progress rept. no. 57.
15 Oct 65, 47p. Contract AF41 609 1693 Proj. 7757 Task 775702

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. See also AD-615 174.

Descriptors: (*Radiation effects, Tissues (Biology)), (*Tissues (Biology), Radiation effects), X rays, Sublethal dosage, Liver, Enzymes, Metabolism, Barbiturates, Amines, Toxicity, Biosynthesis, Inhibition, Oxygen consumption, Central nervous system, Mammals, Sex, Rats

The report concerns studies on the scope and the nature of the inhibitory affect of x-radiation on the biosynthesis of enzymes in the microsomal fraction of the liver. The results of the research summarized in the report indicate that radiation specifically inhibits the process responsible for the development of a sex difference in hepatic detoxification enzymes in rats and that this effect is mediated through some area in the central nervous system.

AD-623 610 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
SAO PAULO UNIV (BRAZIL) INSTITUTO DE MEDICINA TROPICAL
KIDNEY AND LIVER PATHOLOGY IN HUMAN AND EXPERIMENTAL LEPTOSPIROSIS.
Annual rept. no. 1, 15 Oct 64-15 Oct 65,
by Thales de Brito, E. Freymuller, H. S. Santos, D. O. Penna, and S. Soares de Almeida. Oct 65. 9p. Contract DA ARO49 092 65G61 Proj. 2N014501B71D

Unclassified report

Descriptors: (*Leptospira, Infections), (*Kidneys, Infectious diseases), (*Liver, Infectious diseases), Toxins + antitoxins, Guinea pigs, Cells (Biology), Humans, Brazil, Histological techniques, Parasitic diseases, Pathology

A light and electron microscopy of human and experimental leptospirosis of the guinea pig was done. The human study was carried out in kidney biopsies. The experimental work, in guinea pigs, was done both in the kidney and liver and histochemical techniques were also performed. The earliest lesion found was at the cell membrane, with partial or total disappearance of the brush border of the cells of the proximal tubuli as well as partial disappearance and distortion of the microvilli of the hepatic cells. Intercellular spaces were found to be enlarged both in the liver and kidney. Capillaries of the experimental animal showed endothelial cell tumefaction and, sometimes, disjunction of the endothelial lining, a finding also in accordance with the basic pathology of the disease. Mitochondrial pathology, seen in humans, was seen in the experimental animal only at the late phase of the disease. However, a definite increase of so called 'dense bodies,' whose origin was discussed, was seen in both cases. Also described, a mild but definite focal glomerular lesion, which provides anatomical basis for the proteinuria seen in the disease. The above described pathology is in accordance with the possibility of a toxin as the main mechanism acting in leptospiral pathogenicity. (Author)

AD-623 615 Div. 16/9
CFSTI Prices: HC $3.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION.
Final rept. for 28 Nov 62-15 Sep 64,
by S. A. Miller, H. A. Dymsza, S. R. Tannenbaum, and S. A. Goldblith. Aug 65, 53p. Contract AF33 657 7660 Proj. 7164 Task 716405 AMRL, TR-64-121

Unclassified report

This investigation is a continuation of studies reported in WADD-TR-60-575 (Aug 1960) and in MRL-TDR-62-35 (May 1962).

Descriptors: (*Nutrition, Space biology), (*Space biology, Nutrition), (*Astronauts, Diet), Life support, Metabolism, Organic compounds, Carbohydrates, Proteins, Fats, Oxidation, Toxicity, Propionic acid, Carboxylic acids, Esters, Chromatographic analysis, Labeled substances, Rats

The aim of these studies was the development of model compounds with which information useful in understanding energy metabolism might be obtained to aid in development of food for space travel. Seven-month studies feeding rats with 1,3-butanediol have been completed. The results of these studies confirm the utilization of this compound as an energy source. Measurement of a number of metabolic parameters at the completion of the study support the contention that 1,3-butanediol is probably metabolized through carbohydrate rather than fat pathways. Metabolism studies with 2,4-dimethylheptanoic acid labeled with C14 in the alpha methyl group indicate that this compound as predicted is oxidized through propionate. Design and construction details of the direct animal calorimeter are presented. Results of a limited number of studies with rats fed various diets indicate that the device fulfills its design functions. (Author)

AD-623 622 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
PARACHUTING FOR SPORT,
by Frank W. Kiel. 1965, 5p.

Unclassified report

Pub. in Journal of American Medical Association v194 p264-8 Oct 18 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Parachute jumping, Recreation), (*Accidents, Parachute jumping), Survival, Training, Wounds + injuries

Parachuting has existed for 180 years but has gained many adherents only in recent years. Sport parachuting is estimated to have 50,000 participants in 1964. Although parachuting is a potentially dangerous activity, fatalities are rare-approximately 1 in 17,000 jumps. Fatalities, though usually thought of as the result of multiple extreme injuries sustained in abrupt ground deceleration, have many other causes. Among these causes of death have been collision of jumpers, landing on a power line, heart attack during descent, and drowning. Major factors behind many of these accidents have been (1) lack of proper repetitive training by qualified instructors and (2) lack of adequate supervision, particularly of students. Analysis of the accidents has shown that one third occurred during the preliminary training period, but in others, jumpers with long experience have died also. Temperature, cloud conditions, and wind have not been shown to be major factors. A few miraculous escapes are known in parachuting-survival of a fall from great height without the aid of a parachute. Such events usually have the benefit of a long decelerative interval because of landing in plowed fields or trees and an optimal diffusion of body impact, as in landing on the back in a spread-eagle position. (Author)

AD-623 623 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
PSAMMOMA BODIES ASSOCIATED WITH EXPERIMENTAL THYROID HYPERPLASIA IN THE RAT,
by R. H. Follis Jr.. 26 Apr 65, 4p.

Unclassified report

Pub. in Proceedings of the Society for Experimental Biology and Medicine v119 p931-4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thyroid gland, Neoplasms), (*Neoplasms, Thyroid glands), (*Iodine, Deficiency diseases), (*Deficiency diseases, Neoplasms), Morphology (Biology), Etiology, Laboratory animals, Tissues (Biology), Rats, Hamsters, Mice, Monkeys

Psammoma bodies were noted in the hyperplastic thyroid glands of rats which were fed iodine-deficient diets. Such bodies were not observed in hamsters, mice, and monkeys maintained on similar diets. (Author)

AD-623 641 Div. 16/10
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
AN ANALYSIS OF LOCAL AND SYSTEMIC EFFECTS OF IONIZING RADIATION ON BONE GROWTH,
by Richard D. Phillips, and Donald J. Kimeldorf.
3 Sep 65, 29p. Rept. no. usnrdl-TR-898
Proj. MR005 08 5201 Task 2
NAVMED, MR005.08-5201-2

Unclassified report

Descriptors: (*Radiation effects, Bone), (*Bone, Radiation effects), Whole body irradiation, Partial body irradiation, X rays, Growth, Tissues (Biology), Head, Abdomen, Thorax, Rats

Radiation-induced retardation of femur and tibia growth was determined in young male rats at 60 days after total- or partial-body exposure to 450 R of x-rays. Approximately 52% of the growth reduction could be attributed to local irradiation effects on the limb, and the remaining 48% of the retardation was ascribed to systemic irradiation effects. The systemic response did not appear to be dependent upon the mass of tissue irradiated, nor upon the induction of postirradiation partial inanition. However, the region of the animal exposed did appear to be important. By exposing various regions of the body, the systemic response was subdivided into abscopal components. Head, abdomen and thorax irradiation yielded 42%, 40% and 18%, respectively, of the total systemic effect. The local and abscopal responses appear to be additive rather than synergistic, with the total radiation effect the resultant sum of the abscopal and local components. (Author)

AD-623 671 Div. 16/1
CFSTI Prices: HC $4.00 MF $0.75
RAND CORP SANTA MONICA CALIF
ON THE CONTROL OF URINE FORMATION,
by J. C. DeHaven, and N. Z. Shapiro. Nov 65, 104p. Rept. no. P-3254

Unclassified report

Descriptors: (*Urine, Control), Kidneys, Mathematical models, Physical chemistry, Electrolytes (Physiology), Body fluids, Water, Matrix algebra, Sea water, Magnesium, Calcium, Phosphates, Diet, Ammonium compounds, Chlorides, Sodium compounds, Bicarbonates, Excretion, Metabolism, Blood plasma

A presentation of mathematical and physicochemical models of the intrinsic renal control of body water and electrolytes. On the basis of these models, Jacobian Matrices are prepared which assist in predicting local qualitative changes in body water and electrolytes in response to various forms of chemical stress. The results obtained in certain specific examples compare favorably with those of reported physiological experiments. The Paper discusses the usefulness and limitations of these models, and describes various methods for introducing time into them--the most useful one being that in which the flux of metabolites is derived from the composition and flow of urine. (Author)

AD-623 676 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
TRAINING THE VESTIBULE FOR AEROSPACE OPERATIONS. CENTRAL CONTROL OF VESTIBULAR FUNCTION,
by Kent K. Gillingham. Sep 65, 32p. Rept. no. review-8-65
Unclassified report

Descriptors: (*Vestibular apparatus, Space medicine), (*Space medicine, Vestibular apparatus), Stress (Physiology), Semicircular canals, Acceleration tolerance, Ear, Central nervous system, Nerves, Rotation, Motion sickness, End organs, Stimulation, Hearing, Nervous system, Physiology, Space perception, Training, Adaptation (Physiology)

Emphasis is placed on the evidence that the vestibular system is capable of being trained. One aspect of the mechanism by which training can be wrought, the vestibular efferent system, is discussed. On the basis of the understandings of the vestibular system, of spatial disorientation, and of motion sickness, one should be able to deal with operational vestibular problems by using the tools of education and training. It remains to be determined whether the most effective and economical approach to vestibular training lies in more effective didactics, more sophisticated utilization of the suppression mechanism, the actual changing of erroneous vestibular responses into correct responses, or any combination thereof. Whatever the method, the need for vestibular training persists as long as spatial disorientation wastes the lives of aircrew and motion sickness compromises military effectiveness. (Author)

AD-623 687 Div. 16/10,16/1
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
CHEMICAL STUDIES OF STOOLS: A COMPARISON OF NORMAL STOOLS, CHOLERA STOOLS, OTHER DIARRHEAL STOOLS, AND ARTIFICIALLY INDUCED STOOLS.
Research rept.,
by J. W. Fresh. 1965, 6p.
NAVMED , MR005.09-1040.1.25
Unclassified report

Reprinted from Proceedings of Cholera Research Symposium, Honolulu, Hawaii. PHS pub. 1328 p296-9 Jan 24-29 1965 (Copies available only to DDC users).

Descriptors: (*Excretion, Humans), (*Cholera, Excretion), (*Diarrhea, Excretion), Medical examination, Chemical analysis, Electrolytes (Physiology), Sodium, Potassium, Volume, Iron, Intestines, Mucus, Membranes (Biology), Diagnosis, Taiwan

The chemistry of cholera stools is compared with those of other diarrheas, artificially induced liquid stools, and normal formed stools. The sodium concentration tends to decrease and the potassium concentration tends to increase as the stool volume decreases. Although iron is not regarded as an electrolyte and is not considered freely diffusable through the bowel mucosa, it too is present in the stools of NPO cholera patients in appreciable quantities. This likely represents mucosal cells that are dissociated earlier and more frequently from the mucosa in cholera. (Author)

AD-623 688 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
PATHOPHYSIOLOGY OF CHOLERA,
by R. A. Phillips. 1965, 5p. Rept. no. 64-1
NAVMED , MR005.09-1040.1
Unclassified report

Reprint from Proceedings of Cholera Research Symposium PHS pub. 1328 p82-5 Jan 24-29 1965 (Copies available only to DDC users).

Descriptors: (*Cholera, Pathology), (*Electrolytes (Physiology), Cholera), Ions, Semipermeability, Intestines, Mucus, Membranes, Toxicity, Transport properties, Gastrointestinal system, Sodium, Excretion, Secretion, Reviews, Taiwan

AD-623 689 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
THE EFFECT OF GLUCOSE ON CATION TRANSPORT.
Research rept.,
by A. H. G. Love. 1964, 6p. Proj. MR005 09 1040 1 23
NAVMED , MR005.09-1040.1.23
Unclassified report

Pub. in Proceedings of the Cholera Research Symposium, Honolulu, Hawaii, 24-29 January 1965. Public Health Service Publication no. 1328 p144-7 (Copies available only to DDC users).

Descriptors: (*Glucose, Absorption (Biological)), (*Electrolytes (Physiology), Cholera), (*Cholera, Glucose), Intestines, Mucus, Membranes (Biology), Semipermeability, Osmosis, Ions, Transport properties, Body fluids, Therapy, Taiwan

The studies indicate that the accumulation of fluid in the cholera-infected intestinal loop is more related to excessive fluid production rather than to an absorption or sodium pump failure. The studies in human cholera patients are consistent with this conclusion. These patients can absorb glucose and this causes a silmultaneous increase in sodium absorption by the intestine. This finding may prove to have therapeutic value. (Author)

AD-623 690 Div. 16/10,16/13,16/2
SAMUEL C HARVEY METABOLIC LAB YALE UNIV NEW HAVEN CONN
EFFECT OF STAPHYLOCOCCAL TOXIN ON RENAL FUNCTION: IRREVERSIBLE SHOCK,
by D. G. Skinner, and M. A. Hayes. 28 Jul 64, 18p. Contract Nonr60910 Grant ,PHS AM02722 04 Proj. NR105057
Unclassified report

Pub. in Annals of Surgery v162 n2 p161-80 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Staphylococcus, Toxins + antitoxins), (*Toxins + antitoxins, Urinary system), (*Shock (Pathology), Toxins + antitoxins), Blood analysis, Urine, Excretion, Blood pressure, Osmosis, Blood chemistry, Pathology, Histology, Photomicrography, Parenteral infusions, Dosage, Dogs

The effect of varying intravenous doses of a staphylococcal toxin on renal function has been studied. Results indicate that the toxin in low doses acts selectively on the kidney. Both total and estimated renal blood flow and glomerular filtration were decreased by doses of toxin insufficient to cause significant systemic blood pressure changes or pathologic alterations in other organ systems. (Author)

AD-623 692 Div. 16/10
TEMPLE UNIV PHILADELPHIA PA SCHOOL OF MEDICINE
FIBROUS PAPULE OF THE NOSE: A CLINICOPATHOLOGICAL STUDY,
by James H. Graham, John B. Sanders, Waine C.Johnson, and Elson B. Helwig. 25 Sep 64, 11p. Contract PHS 2A5289C2
Unclassified report

Pub. in Journal of Investigative Dermatology v45 n3 p194-203 1965 (Copies not available to DDC or Clearinghouse customers). Presented at Annual Meeting of The Society for Investigative Dermatology, Inc. (25th), San Francisco, Calif. 21-23 Jun 64.

Descriptors: (*Neoplasms, Nose), (*Nose, Neoplasms), Diagnosis, Pathology, Skin, Excision, Histology, Histological techniques

A clinicopathological study of 40 patients with a distinct isolated fibrous papule of the nose is reported. The histogenesis and pathogenesis of this unique tumor indicates the lesion probably represents the residual of a cellular nevus in which stromal elements persist because of the anatomical location. There is a microscopic similarity of the fibrous papule to facial lesions of adenoma sabaceum and solitary hamartomas. For this reason the possibility that the lesion could represent a hamartoma or unusual type of neural end organ tumor can not definitely be ruled out. We propose the name of fibrous papule for this benign dome-shaped tumor of the nose. Fibrous papule should be included in the differential diagnosis of lesions involving the nose, and particularly if the clinical characteristics are suggestive of a cellular nevus. Excision of the lesion flush with the surrounding skin is adequate treatment and allows for excellent cosmetic results. (Author)

AD-623 693 Div. 16/10,16/2
WASHINGTON UNIV SEATTLE DEPT OF PREVENTIVE MEDICINE
MYCOPLASMA PNEUMONIAE (EATON PPLO) RESPIRATORY DISEASE AMONG AMERICAN MILITARY PERSONNEL ON TAIWAN, REPUBLIC OF CHINA.
Research rept.,
by John J. Picken, and Howard M. Jenkin. 12 Mar 65, 12p. Contract PHS2E206N1A1D ,NonrG00034 64
NAVMED , MR005.09-1201.4.8
Unclassified report

Pub. in Journal of the Formosan Medical Association v64 n7 p395-404 28 Jul 1965 (Copies available only to DDC users). Prepared in cooperation with Naval Medical Research Unit no. 2, Taipei (Taiwan).

Descriptors: (*Mycoplasma, Respiratory diseases), (*Respiratory diseases, Military personnel), (*Military medicine, Respiratory diseases), Epidemiology, Antigens + antibodies, Etiology, Taiwan

A brief review of the salient facts about Mycoplasma pneumoniae (Eaton PPLO) respiratory infection is presented. M. pneumoniae (PPLO) lower respiratory disease is described from an outbreak among American military personnel and dependents on Taiwan. Of 21 patients 13 were found to have penumonitis. Clinical features of those cases with pneumonia were indistinguishable from other atypical pneumonias. M. pneumoniae was isolated from 1 of 21 throat swabs. Serologic evidence of this organism as the etiologic agent in these respiratory infections was shown in 13 of 15 paired sera tested using a microtiter complement-fixation test. A significant level of CF antibodies appeared within ten days after onset of ill-

ness and persisted throughout the 93 day period of observation. It is the purpose of this report to indicate the presence of M. pneumoniae and nature of the illness produced by this organism to the medical practitioner of Taiwan. (Author)

AD-623 694 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
WATER AND ELECTROLYTE ABSORPTION BY THE INTESTINE IN CHOLERA.
Research rept.,
by R. A. Phillips, C. K. Wallace, and R. Q. Blackwell. 1965, 15p.
NAVMED , MR005.09-1040.1.16
Unclassified report

Reprinted from Proceedings of Cholera Research Symposium Honolulu, Hawaii, PHS pub. 1328 p299-311 Jan 24-29 1965 (Copies available only to DDC users).

Descriptors: (*Cholera, Electrolytes (Physiology)), (*Electrolytes (Physiology), Absorption (Biological)), (*Absorption (Biological), Cholera), Water, Intestines, Membranes (Biology), Mucus, Semipermeability, Ions, Transport properties, Convalescence, Taiwan

The cholera patient's ability to absorb orally administered water and the Na (+), K (+), Cl (-), and HCO3 (-) ions was determined in 12 subjects. In some of the patients the studies were repeated in convalescence. Studies on these typical patients are discussed in sufficient detail to show that H2O and the K (+) and HCO3 (-) ions are readily absorbed, while NaCl given orally is not absorbed in acute, severe cholera. However, net absorption of these ions is readily shown in convalescence. (Author)

AD-623 695 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
ELECTROLYTE FLUXES IN THE ISOLATED ILEAL LOOP.
Research rept.,
by T. G. Mitchell. 1965, 6p.
NAVMED , MR005.09-1040.1.24
Unclassified report

Reprinted from Proceedings of Cholera Research Symposium, Honolulu, Hawaii PHS pub. 1328 p279-82 Jan 24-29 1965 (Copies available only to DDC users).

Descriptors: (*Intestines, Electrolytes (Physiology)), (*Electrolytes (Physiology), Cholera), (*Cholera, Electrolytes (Physiology)), Semipermeability, Ions, Transport properties, Gastrointestinal system, Absorption (Biological), Membranes (Biology), Mucus, Radioactive isotopes, Labeled substances, Half life, Taiwan

A technique is described for study of unidirectional transfer rate of electrolytes using radioisotopes of differing half lives. Ileal loops were inoculated with cholera vibrios and allowed to incubate for 4-20 hours. Transfer rates for lumen to plasma and plasma to lumen flux were determined in control and in infected loops. Diminution of sodium transfer from lumen to plasma in the infected rabbit ileal loop could not be demonstrated without a concomitant decrease in the lumen to plasma flux of potassium ion. (Author)

AD-623 700 Div. 16/10,16/11
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
CATHARTICS AND THE SODIUM PUMP.
Research rept.,
by R. A. Phillips, A. H. G. Love, T. G. Mitchell, and E. M. Neptune. 1964, 4p. Proj. MR005 09 1040 1 21
NAVMED , MR005.09-1040.1.21
Unclassified report

Pub. in Nature, v206 n4991 p1367-8 Jun 26 1965. (Copies available only to DDC users).

Descriptors: (*Cathartics, Electrolytes (Physiology)), (*Cholera, Electrolytes (Physiology)), (*Electrolytes (Physiology), Semipermeability), Sodium, Ions, Transport properties, Intestines, Membranes (Biology), Mucus, Diarrhea, Absorption (Biological), Oxygen consumption, Amphibeans, Skin, Taiwan

In view of the results presented the classical concept of cathartic action by simple irritation with enhanced peristalsis must be re-evaluated and the probability of very specific mechanisms must be entertained. These investigations are continuing in an attempt to assess the role of these and other cathartics on active Na (+)ion transport in man and other species.

AD-623 362 **See Fld. 6/3**

AD-623 376 **See Fld. 6/15**

AD-623 381 **See Fld. 6/15**

AD-623 481 **See Fld. 6/15**

AD-623 490 **See Fld. 6/15**

AD-623 493 **See Fld. 6/1**

7/1. CHEMICAL ENGINEERING

AD-623 251 Div. 4/1 ,4/2 ,10/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PURIFICATION OF BORON: ANNOTATED BIBLIOGRAPHY.
Rept. no. 2 on AID Work assignment no. 41, task 7.
15 May 64, 6p. Rept. no. AID-U-64-40
TT , 65-64462
Unclassified report

Based on Soviet open source material available at the Aerospace Information Div., Library of Congress for the year 1957. Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Boron, Purification), Bibliographies, Reviews, USSR

Seven abstracts are included, each with an abstract or a reference to an entry in chemical abstracts.

7/2. INORGANIC CHEMISTRY

AD-623 165 Div. 4/2 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
BELL AND HOWELL RESEARCH CENTER PASADENA CALIF
ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF TRACE IMPURITIES IN CADMIUM SULFIDE.
Technical documentary rept. for 1 Jun 62-31 May 65,
by R. K. Willardson, and A. J. Socha. Jun 65, 61p. Contract AF33 657 8976 Proj. 7885 Task 788503
ARL , 65-130
Unclassified report

Descriptors: (*Semiconductors, Impurities), (*Cadmium compounds, Sulfides), (*Mass spectroscopy, Semiconductors), Spectrum analyzers, Sparks, Powders, Single crystals, Contamination, Ionization potentials, Zinc alloys, Zinc compounds, Selenium alloys, Solid solutions, Cadmium, Zinc, Cadmium alloys

Analytical techniques were developed for the analysis of trace impurities in cadmium sulfide. The detection limit for most impurities is less than 10 parts per billion (atomic). Materials analyzed were in the form of fine powders, fragile needles and platelets, as well as bulk crystals of CdS, CdSe, ZnS, ZnSe, CdS:CdSe, CdS:ZnSe, Cd and Zn. The approaches used for obtaining accurate analytical results are applicable to most solid state materials. (Author)

AD-623 185 Div. 4/2 ,4/4
CFSTI Prices: HC $3.00 MF $0.75
OXFORD UNIV (ENGLAND) INORGANIC CHEMISTRY LAB
THE REACTION OF ATOMS AND RADICALS WITH VARIOUS MOLECULES.
Final rept.,
by J. W. Linnett. Mar 65, 73p. Contract AF EOAR63 32
AFOSR , 65-1491
Unclassified report

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Descriptors: (*Catalysis, Adsorption), (*Hydrogen, Adsorption), (*Oxidation, Reaction kinetics), (*Oxygen, Recombination reactions), (*Pressure gages, Operation), Atoms, Free radicals, Molecules, Chemical reactions, Paladium, Paladium alloys, Gold alloys, Metals, Corrosion, Surface properties, Alkali metal compounds, Tungsten compounds, Chlorine, Great Britain

Some experiments were accomplished on the absorption of hydrogen atoms by palladium, and palladium-gold alloys. This work was carried out in connection with some earlier work on the catalytic effect of these metals and alloys on the recombination of hydrogen atoms. The attack of a number of metals by molecular and atomic oxygen was examined in order to discover in which cases there were considerable differences in rate. Experiments were also undertaken on the recombination of oxygen atoms on the surface of the alkali metal tungsten bronzes. A pressure gauge is described which was devised for the rapid and convenient measurement of pressures in mixtures containing chlorine at pressures of the order of 1 mm., the accuracy being about =0.01 mm.

AD-623 388 Div. 4/2 ,20/3
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
A COMPENDIUM OF RADIOCHEMICAL PROCEDURES FOR THE DETERMINATION OF SELECTED FISSION PRODUCTS IN SEA WATER,
by M. G. Lai, and H. A. Goya. 19 Aug 65, 43p.
Rept. no. USNRDL-TR-912
Contract AT49 5 2084
Unclassified report

Descriptors: (*Sea water, Fission products), (*Fission products, Chemical analysis), (*Radiochemistry, Sea water), Cesium, Strontium, Yttrium, Cerium, Barium, Zirconium, Ruthenium, Molybdenum, Iodine, Solvent extraction, Chemical precipitation, Ion exchange, Chromatographic analysis, Reviews

Procedures are described for analyzing seawater samples for the following fission-product nuclides: Cs137, Sr89, Sr90, Y91, Ce141, Ce144, Ba140, Zr95, Ru103, Ru106, Mo99, and I131. All procedures employ either solvent extraction, precipitation, or ion exchange chromatography to separate the fission products from seawater. (Author)

AD-623 633 Div. 4/2 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C

SPECTOPHOTOMETRIC STUDIES OF CHLOROCOMPLEXES OF NICKEL (II) AND COBALT (II) IN MOLTEN LICL-KCL EUTECTIC WITH A NEW MODERN HIGHTEMPERATURE ASSEMBLY,
by Masato Mamiya. Nov 65, 17p. Rept. no. T-1807-65
Contract DA44 009AMC930T Proj. DA1C014 501A32B
TT , 65-64498

Unclassified report

Trans. of Bunseki Kagaku (Japan) v14 p519-26 1965.

Descriptors: (*Spectrophotometers, Design), (*Complex compounds, Spectroscopy), (*Nickel compounds, Complex compounds), (*Cobalt compounds, Complex compounds), Furnaces, Absorption spectrum, Lithium compounds, Potassium compounds, Chlorides, Atomic orbitals, Blackbody radiation, Salts, Eutectics, Japan

A high-temperature cell assembly for spectrophotometric studies of molten salts was designed and constructed. The absorbances were measured without correction over the wide range of wavelengths from 0.3-2.5 microns and on temperatures to 800C with its control of =0.5 percent. The absorption spectra of nickel and cobalt chlorides in LiCl-KCl eutectic were studied for these wavelengths at temperature ranges of 360-700C. During the melting period, nickel and cobalt, which show absorption of 3d electrons, showed strong effects by sintering of the salt solutions. At below 390C special spectral changes were noted. However, above 400C the spectra are stable, since the solutions are completely molten, but the nickel chlorocomplex showed multi-existence, and at a temperature of 500C it finally became a single complex. The reproducibility of spectra at each temperature was good and showed promising signs for analytical applications. (Author)

AD-623 635 Div. 4/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
SIMPLE CYANOGEN AND CYANURYL COMPOUNDS, I. HEXACYANOGEN (CYANURYL CYANIDE),
by Erwin Ott. Nov 65, 16p. Rept. no. T-1809-65
Contract DA44 009AMC930T Proj. DA1C014 501A32B
TT , 65-64500

Unclassified report

Trans. of Chemische Berichte (Germany) v52 p656-65 1919.

Descriptors: (*Cyanogen, Chemical properties), (*Cyanides, Chemical properties), (*N-heterocyclic compounds, Chemical properties), Synthesis (Chemistry), Azines, Crystallography, Decomposition, Chemical reactions, Alcohols, Chlorine, Hydrochloric acid, West Germany

Topics include: preparation of hexacyanogen by hydrolysis of cyanuryl tricarboxylic acid amide; crystallographic properties; thermal depolymerization to dicyanogen; saponification by water; formation of cyanuric acid trimethyl ester by the action of methanol; behavior in the presence of chlorine and hydrogen chloride.

AD-623 095 See Fld. 7/4

AD-623 251 See Fld. 7/1

AD-623 263 See Fld. 20/2

AD-623 313 See Fld. 7/4

AD-623 541 See Fld. 7/4

7/3. ORGANIC CHEMISTRY

AD-623 088 Div. 4/3 ,14/8
CFSTI Prices: HC $2.00 MF $0.50
UNIVERSITY OF WESTERN ONTARIO LONDON
ORGANOMETALLIC COMPOUNDS AND POLYMERS BASED ON METAL-NITROGEN BOND SYSTEMS.
Technical rept. for 1 Jan - 31 Dec 64,
by D. C. Bradley. Jul 65, 27p. Contract AF33 615 1324 Proj. 7342 Task 734201
ML , TR-65-131

Unclassified report

See also AD-454 640.

Descriptors: (*Metalorganic compounds, Synthesis (Chemistry)), (*Polymers, Metalorganic compounds), (*Organic nitrogen compounds, Polymers), (*Chromium compounds, Metalorganic compounds), Amines, Magnetic properties, Magnetic moments, Hydrolysis, Stereochemistry, Amides, Zirconium compounds, Titanium compounds, Hafnium compounds, Nickel compounds, Iron compounds, Molybdenum compounds, Tungsten compounds, Complex compounds, Spectra (Infrared)

From the reaction of primary alkyl amines, with tris (diisopropylamino)-chromium (III) the tris-(alkylamino)chromium (III) compounds, Cr (NHR)3, were obtained as pink or red, insoluble, non-volatile solids which were significantly resistant to hydrolysis. Magnetic susceptibility measurements revealed anomalously low magnetic moments indicative of magnetically concentrated chromium atoms. It is suggested that these compounds are metalnitrogen co-ordination polymers with octahedrallyco-ordinated chromium. With branched chain primary amines entirely different products were obtained due to steric factors. Reactions between tetrakis-(dimethylaninotitanium, -zirconium, or -hafnium with nickel, iron, molybdenum or tungsten carbonyls gave interesting polymeric heterometalcarbonyldimethylamides. Reactions of aniline with tetrakis-(diethylamino)-titanium or tetrakis-(diethylamino)-zirconium gave soluble polymeric compounds. (Author)

AD-623 089 Div. 4/3 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA INST OF TECH PASADENA DIV OF CHEMISTRY AND CHEMICAL ENGINEERING
ORGANIC REACTION MECHANISM.
Final rept.,
by Richard E. Pincock. 1960, 11p. Contract AF49 638 696
AFOSR , TR-60-122

Unclassified report

Descriptors: (*Organic nitrogen compounds, Chemical properties), (*Catalysis, Paramagnetic materials), (*Formates, Chemical reactions), Synthesis (Chemistry), Decomposition, Reaction kinetics, Thermochemistry, Polycyclic compounds, Ketones, Esters, Pyrolysis

Research in the following areas is summarized: improved synthesis of tetraphenyl tetrazene and its decomposition kinetics and products; paramagnetic catalysis of thermal reactions, with special attention to the dimerization and oxidation of anthracene and to the decarbonylation of alpha-keto esters; preparation and decomposition kinetics of t-butyl peroxyformate.

AD-623 202 Div. 4/3
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
ALLYLIC OXIDATION OF OLEFINS BY MERCURIC ACETATE,
by Zvi Rappoport, Paul D. Sleezer, S. Winstein, and W. G. Young. 13 Aug 65, 11p.
AROD , 3580:21

Unclassified report

Pub. in Tetrahedron Letters n42 p3719-28 1965 (Copies available only to DDC users). Research supported in part by NSF, ARO, and Petroleum Research Fund, administered by American Chemical Society.

Descriptors: (*Alkenes, Oxidation), (*Mercury compounds, Acetates), (*Metalation, Mercury compounds), Metalorganic compounds, Chemical reactions, Reaction kinetics, Chemical equilibrium

AD-623 214 Div. 4/3
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
THE STEREOCHEMISTRY OF THE REACTION OF TETRACHLOROETHYLENE WITH P-TOLUENETHIOLATE REAGENT,
by W. E. Truce, M. G. Rossmann, F. M. Perry, R. M. Burnett, and D. J. Abraham. 13 Mar 65, 8p. Contract PHS CA04536 06 ,NSF GB02905

AROD , 3047:9

Unclassified report

Pub. in Tetrahedron v21 p2899-2905 1965 (Copies available only to DDC users).

Descriptors: (*Halogenated hydrocarbons, Chemical reactions), (*Organic sulfur compounds, Chemical reactions), (*Stereochemistry, Halogenated hydrocarbons), Chlorine compounds, Alkenes, Thiols, Aromatic compounds, Molecular structure, Molecular isomerism, Diene synthesis, Crystal structure

Sodium p-toluenethiolate reacts with tetrachloroethylene in refluxing ethanol to give trans-1,2-bis (p-tolylthio)- 1,2dichloroethylene. The structure is assigned on the basis of crystallographic and supporting data. (Author)

AD-623 285 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
CLEAVAGE OF ORGANOSULFUR COMPOUNDS BY METALS. SULFENE CHEMISTRY.
Final rept. for 1 Sep 61-30 Sep 65,
by William E. Truce. 30 Sep 65, 5p. Contract DA31 124AROD211 Grant ,DA ARO D31 124G146
AROD , 3047:10

Unclassified report

Descriptors: (*Organic sulfur compounds, Decomposition), Sulfides, Ketones, S-heterocyclic compounds, Chemical reactions, Metals, Stereochemistry

Reductive cleavages of organic sulfides and sulfones were studied in order to determine (a) how they could be effected cleanly and in high yield, and (b) more about their nature and possible mechanistic paths by determining the orientation of such cleavages with unsymmetrical systems and the stereochemistry of these processes. Studies were carried out to determine the possible existence of a sulfene (CH2SO2) and the utility of such a highlyreactive sulfur-containing intermediate in synthetic organic chemistry. Results are briefly summarized and a list of publications generated is given.

AD-623 307 Div. 4/3 ,14/8
CFSTI Prices: HC $3.00 MF $0.50
AKRON UNIV OHIO INST OF RUBBER RESEARCH
LOW TEMPERATURE POLYMERIZATION STUDIES.

Progress rept. no. 7, 1 Jul-30 Sep 65,
by Maurice Morton. 27 Oct 65, 52p. Contract AF04 611 9694 Proj. AFSC 3148
Unclassified report

See also AD-618 228.

Descriptors: (*Radiation chemistry, Polymerization), (*Polymerization, Low-temperature research), (*Halocarbon plastics, Synthesis (Chemistry)), Halocarbon plastics, Fluorine compounds, Alkenes, Reaction kinetics, Free radicals, Gamma rays, Organic solvents, Vinyl plastics

Further investigation of the radiation polymerization of fluoral in methylene chloride confirmed that a rate relation of the form Rp = kp ((M) (M)/S), (where M = monomer, and S = solvent) can be applied over a range of monomer concentration from 1 to 6 molar. This can be taken as evidence for termination by reaction with the methylene chloride. The results are consistent with a preferred anionic mode of polymerization of this monomer. Other experiments have shown that fluoral is very readily polymerized by bases, even by such weakly basic compounds as dimethylformamide. The polymerization of the fluorovinyl monomers is probably caused by the high energy radical-cation formed as a result of primary radiolysis, i.e. (using VF as an example): CH2 = CH2 + photon (yields) .CH2CHF (+) + e (-). This species can polymerize as a cation or as a radical; however, at low temperature the cation reaction is the more vigorous: .CH2CHF (+) + VF (yields) . (CH2CHF)mCH2CHF (+).

AD-623 344 Div. 4/3
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
STUDIES IN PHOSPHINEMETHYLENE CHEMISTRY. XII. TRIPHENYLPHOSPHINE-T-BUTYLMETHYLENE AND TRIPHENYLPHOSPHINE TRIMETHYLSILYLMETHYLENE,
by Dietmar Seyferth, and Gurdial Singh. 27 May 65, 7p.
AROD , 2832:25
Unclassified report

Pub. in Journal of the American Chemical Society v87 n18 p4156-62 20 Sep 1965 (Copies not available to DDC or Clearinghouse customers). Supported by Army Research Office (Durham). See also AD-620 591.

Descriptors: (*Phosphines, Chemical reactions), (*Organic phosphorus compounds, Synthesis (Chemistry)), Stereochemistry, Silicon compounds, Nuclear spins, Phosphine oxides, Polycyclic compounds

Alpha-Proton transfer from (C6H5)3PCH2M (CH3)3I (M = Si and C) to triphenylphosphine methylene was found to proceed essentially quantitatively in ether medium. Steric factors are believed responsible for this facile transylidation reaction. Reactions of triphenylphosphine trimethylsilylmethylene and triphenylphosphine-tbutylmethylene thus formed with water, hydrogen bromide gas, and methyl iodide are described. Triphenylphosphinet-butylmethylene reacted with benzaldehyde to give a mixture of cis- and trans-beta-t-butylstyrene in 84% yield. Spin-spin coupling between P31 and the gammaprotons in the neopentylphosphonium salt and in neopentyl diphenylphosphine oxide was observed. (Author)

AD-623 474 Div. 4/3
YALE UNIV NEW HAVEN CONN DEPT OF CHEMISTRY
SOLVOLYTIC REACTIONS OF BICYCLO (3. 1. 0)HEXANE-6-METHANOL,
by Kenneth B. Wiberg, and Arthur J. Ashe. 11 Mar 65, 7p.
AROD , 3626:8
Unclassified report

Pub. in Tetrahedron Letters n21 p1553-8 1965 (Copies available only to DDC users).

Descriptors: (*Cyclohexanes, Chemical reactions), (*Alcohols, Chemical reactions), Solvents, Decomposition, Stereochemistry, Organic sulfur compounds

AD-623 479 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES
ELECTROPHILIC SUBSTITUTION AT SATURATED CARBON.
Final rept.,
by D. J. Cram. 21 Oct 65, 3p. Contract DA ARO D31 124G306 Proj. DA00925001,ARO D3632C
AROD , 3632:12
Unclassified report

Descriptors: (*Substitution reactions, Organic compounds), (*Organic compounds, Substitution reactions), Stereochemistry, Reaction kinetics

A broad range of problems were studied. The problems studied can be summarized as follows: (1) the stereochemistry of carbanions, and the mechanism of anionic allylic rearrangements; (2) behavior of carbonium ions in unusual environments; (3) 1,2- and 1,3-asymmetric induction; (4) mechanism of E (i) reaction; (5) electrophilic substitution of diazocyclopentadiene. (Author)

AD-623 489 Div. 4/3
YALE UNIV NEW HAVEN CONN DEPT OF CHEMISTRY
BICYCLO (1.1.0) BUTANE.
Revised ed.,
by K. B. Wiberg, D. S. Connor, P. Schertler, R. P.Ciula, and G. M. Lampman. 5 May 65, 22p.

AROD , 3626:9
Unclassified report

Pub. in Tetrahedron v21 p2749-69 1965 (Copies available only to DDC users). Prepared in cooperation with Washington Univ., Seattle. Revision of manuscript received 19 Mar 65.

Descriptors: (*Cyclobutanes, Chemical properties), Chemical bonds, Stereochemistry, Atomic orbitals, Chemical reactions, Thermodynamics

The chemistry of bicyclo (1.1.0) butane and some of its derivatives is reviewed. The effect of its bond angle deformation on its strain energy, its orbital hybridization, and its reactivity is discussed. (Author)

AD-623 539 Div. 4/3
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
HALOMETHYL-METAL COMPOUNDS. I. PREPARATION OF PHENYL (TRIHALOMETHYL) MERCURY COMPOUNDS,
by Dietmar Seyferth, and James M. Burlitch. 2 Feb 65, 11p.
AROD , 2832:21
Unclassified report

Pub. in the Journal of Organmetallic Chemistry v4 p127-37 1965 (Copies available only to DDC users).

Descriptors: (*Mercury compounds, Metalorganic compounds), (*Metalorganic compounds, Synthesis (Chemistry)), (*Halogen compounds, Metalorganic compounds), Monocyclic compounds, Chlorine compounds, Bromine compounds

Detailed procedures for the preparation of C6H5HgCCl3, C6H5HgCCl2Br, C6H5HgCClBr2 and C6H5HgCBr3 by the Reutov-Lovtsova method are given. Evidence is presented which indicates that the reaction of phenylmercuric halide, haloform and potassium tert-butoxide forms C6H5HgCX3 by way of nucleophilic displacement of halide ions from mercury by the trihalomethyl anion. (Author)

AD-623 115 See Fld. 20/3

AD-623 264 See Fld. 20/6

AD-623 508 See Fld. 6/1

AD-623 635 See Fld. 7/2

7/4. PHYSICAL CHEMISTRY

AD-623 095 Div. 4/4 ,20/3 ,4/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
THE RADIATION-INDUCED DECOMPOSITION OF MILLIMOLAR CONCENTRATIONS OF HYDROGEN PEROXIDE IN AERATED 'PURE WATER',
by William R. Balkwell, and Susan B. Oldham. 19 Aug 65, 23p. Rept. no. USNRDL-TR-903 Proj. SF011 01 03 Task 11275
Unclassified report

Descriptors: (*Hydrogen peroxide, Decomposition), (*Radiation chemistry, Hydrogen peroxide), Water, Impurities, Reaction kinetics, Dose rate

The decomposition of hydrogen peroxide in aerated 'pure water' was studied as a function of dose and initial hydrogen peroxide concentration, (H2O2)0, in the 1 to 100 millimolar concentration region. Irradiations were performed with a 2000-curie Co60 source at a dose rate of 12.8 kilorads per minute. The decomposition of hydrogen peroxide was found to follow firstorder kinetics with respect to peroxide in the 1 to 100 millimolar concentration range. The specific peroxide decomposition rate constant was observed to decrease with an increase in initial peroxide concentration. The decomposition yield of hydrogen peroxide, G - (H2O2), at a given dose was found to increase significantly with increasing initial peroxide concentration and to be proportional to the square root of the initial peroxide concentration up to about 40 millimolar peroxide. The peroxide decomposition yield for a given initial peroxide concentration was observed to decrease continually during irradiation. The rate of decrease was found to be greater for higher initial concentrations of peroxide. (Author)

AD-623 313 Div. 4/4 ,14/2 ,25/6 ,4/2
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
OPTICAL ABSORPTION STUDY OF THE REDUCTION KINETICS OF RUTILE CRYSTALS.
Technical rept.,
by R. D. Carnahan, and J. O. Brittain. 2 Dec 64, 7p. Rept. no. TR-8
Contract Nonr122817 Proj. NR032 464
Unclassified report

Pub. in Journal of the American Ceramic Society v48 n7 p365-9 Jul 65 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 4 Jun 64.

Descriptors: (*Rutile, Reduction (Chemistry)), (*Reduction (Chemistry), Reaction kinetics), (*Infrared spectroscopy, Rutile), Absorption spectrum, Resistance (Electrical), Crystal lattice defects, Titanium compounds, Dioxides, Semiconductors, Heat of activation

The early stages of the reduction kinetics of singlecrystal rutile, TiO2, were studied by optical absorption techniques for specimens reduced in the range 550 to 760C at a constant vacuum level of 0.001 mm Hg. When reduced to a room-temperature resistivity value of about 0.001 ohm-cm, rutile

shows a blue coloration as a result of a boad infrared absorption band centered at a wavelength of 1.2 microns. The kinetics of growth of the optical absorption coefficient at 1.2 microns fit a parabolic relation. The Arrhenius rate constant, K', exhibited an activation energy of 111 = 9 kcal/mole which is about 50% too high for the diffusion of oxygen in rutile. It is postulated that the defect center is likely to be a Ti interstitial and that the kinetics reflect the self-diffusion of Ti as the rate-controlling mechanism. (Author)

AD-623 341 Div. 4/4 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
LAWRENCE UNIV APPLETON WIS DEPT OF CHEMISTRY
SURFACE STATES IN PURE PALLADIUM.
Final rept. for 1 Oct 62-1 Mar 65,
by Richard W. Zuehlke. Jul 65, 17p. Contract AF AFOSR114 63
AFOSR , 65-1482
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descr ptors: (*Surface properties, Palladium), (*Palladium, Magnetic properties), Particle size, Crystal lattices, Atomic energy levels, Adsorption, Chemisorption, Nitrogen compounds, Oxides, Monomolecular films

Magnetic susceptibility studies on small crystal (112A 500A) palladium blacks and studies of the interaction of adsorbed nitric oxide with palladium surfaces through magnetic susceptibility and standard adsorption techniques were made. The observed dependence of the magnetic susceptibility of palladium on particle size is consistent with a postulate of a band of electronic surface states lying slightly above the bulk 4-d band. Sorption studies indicate that nitric oxide is adsorbed at room temperatures to slightly more than monolayer coverage in both a physisorbed and a weakly energetic chemisorption state (whose precursor is the physisorbed state). In addition, a complex cooperative electronic rearrangement apparently occurs over a small temperature range around room temperature and at monolayer coverage. (Author)

AD-623 415 Div. 4/4 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
UPPSALA UNIV (SWEDEN) INST OF PHYSICAL CHEMISTRY
FLUORESCENCE AND FLUORESCENCE CONVERSION.
Quarterly letter rept., 1 Jul-30 Sep 65,
by Stig Glaessen. 30 Sep 65, 2p. Contract Nonr465400 Proj. arpa order 306
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Fluorescence, Scientific research), Magnesium compounds, Oxides, Powders, Binders, Ultraviolet radiation, Filters (Electromagnetic wave), Photochemistry, Lasers

AD-623 467 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
WASHINGTON UNIV ST LOUIS MO DEPT OF CHEMICAL ENGINEERING
AN INVESTIGATION OF CARBON DEPOSITION.
Progress rept.,
by Eric Weger. 29 Oct 65, 3p. Rept. no. PR-2
Contract AF04 694 695
Unclassified report

Descriptors: (*Carbon, Scientific research), (*Graphite, Scientific research), Porous material, Test equipment, Induction heating, X-ray diffraction analysis, Surface area, Porosity, Measurement

The report period was spent on the construction and installation of the induction heating equipment and on surface area and X-ray diffraction measurements on porous carbon and graphite specimens. Quantitative X-ray diffraction measurements have been performed on powders of the porous carbon and graphite cylinders. These measurements will be used as comparisons when measurements are made of the degree of crystallinity changes occurring in the chars when carbon (or graphite) deposition takes place.

AD-623 475 Div. 4/4 ,16/3 ,7/3 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV ST PAUL DEPT OF BIOCHEMISTRY
INDUCTION OF CONTRACTILE PROPERTIES IN MACROMOLECULAR SUBSTANCES BY LIGHT.
Final rept. for 19 Feb 63-30 Jun 65,
by Rex Lovrien, and Jean C. Waddington. 30 Jun 65, 5p. Contract DA31 124ARO D88
AROD , 4145:2
Unclassified report

Descriptors: (*Polymers, Contraction), (*Photochemistry, Polymers), (*Photochromism, Polymers), Organic pigments, Dyes, Viscosity, Catalysis, Molecular isomerism, Proteins, Photosensitivity

A summary is given of work involving the design and study of polymer systems in which the macromolecules reversibly change their dimensions by light, and also the outline of some of the chemistry of the interaction of isomerizable chromophores with polymers which bind them.

AD-623 540 Div. 4/4
CALIFORNIA INST OF TECH PASADENA DIV OF CHEMISTRY AND CHEMICAL ENGINEERING
THEORY OF STAIRCASE VOLTAMMETRY,
by Joseph H. Christie, and Peter James Lingane.
29 Mar 65, 8p.
AROD , 3406:9
Unclassified report

Pub. in the Journal of Electroanalytical Chemistry v10 p176-82 1965 (Copies available only to DDC users). Supported in part by U. S. Public Health Service.

Descriptors: (*Polarographic analysis, Theory), Electrochemistry, Electrical double layer, Electrodes, Electric currents, Voltage, Chemical analysis

The theoretical relationships for voltammetry with a staircase potential function are developed for a reversible electrode reaction and are shown to be in accord with experiment. Current-potential curves are calculated and tabulated. (Author)

AD-623 541 Div. 4/4 ,25/7 ,4/2
BRIGHAM YOUNG UNIV PROVO UTAH DEPT OF CHEMISTRY
SPECTROPHOTOMETRIC INVESTIGATION OF THE INTERACTIONS IN SOLUTIONS OF TICL4 WITH SEVERAL AROMATIC HYDROCARBONS AND ETHERS,
by J. B. Ott, J. R. Goates, R. J. Jensen, and N. F. Mangelson. 15 Dec 64, 9p.
AROD , 3849:4
Unclassified report

Pub. in Journal of Inorganic and Nuclear Chemistry, v27 p2005-12 1965. (Copies available only to DDC users).

Descriptors: (*Titanium compounds, Chlorides), Absorption spectrum, Spectra (Visible ; ultraviolet), Aromatic compounds, Hydrocarbons, Ethers, Solutions, Complex compounds, Molecular structure

Ultra-violet and visible absorption spectra were obtained for binary solutions of titanium tetrachloride with several aromatic compounds of varying electron density on the ring. These spectra show evidence for a charge-transfer process in such systems. Quantitative absorption studies were conducted on the benzene, anisole, and diphenyl ether containing systems. Attempts to describe the data with Benesi-Hildebrand type equations (J. Amer. Chem. Soc. 71:2703 (1949)) were successful for the two ether-containing systems by assuming 1:1 complexes in the diphenyl ether and both 1:1 and 1:2 complexes in the anisole system. The benzene system shows no evidence for the formation of a complex. The absorption spectrum in this system is ascribed to contact charge-transfer absorption. (Author)

AD-623 550 Div. 4/4
CFSTI Prices: HC $4.00 MF $1.00
PENNSYLVANIA UNIV PHILADELPHIA ELECTRON-CHEMISTRY LAB
ELECTROCHEMISTRY.
Interim technical progress rept. for 7 Nov 646 Sep 65,
by E. Gileadi, W. Heiland, and G. Stoner. Oct 65, 129p. Contract DA44 009AMC469T
Unclassified report

See also AD-612 252.

Descriptors: (*Electrodes, Adsorption), (*Adsorption, Electrochemistry), (*Electrochemistry, Sorption), (*Hydrocarbons, Oxidation), Reaction kinetics, Thermodynamics, Aromatic compounds, Chemical equilibrium, Entropy, Specific heat, pH, Alkenes, Platinum, Phosphoric acid

Contents: Kinetic and thermodynamic aspects of the electrosorption of benzene at platinum electrodes; Hydrocarbon oxidation studies (The electrochemical oxidation of ethylene-comparison of results by the potential sweep and steady state methods; Study of hydrocarbon oxidation in phosphoric acid at high temperature); Electrosorption of uncharged molecules on solid electrodes (a review),

AD-623 579 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LA JOLLA
APPLICATION OF A SELF-CONSISTENT SHCEME INCLUDING EXCHANGE AND CORRELATION EFFECTS TO ATOMS.
Technical rept.,
by B. Y. Tong, and L. J. Sham. 27 Oct 65, 21p.
Rept. no. TR-35
Contract Nonr221611 Proj. NR017 630
Unclassified report

Descriptors: (*Atomic properties, Field theory), Atomic energy levels, Atomic orbitals, Density, Electrostatics, Ionization potentials, Magnetic properties

Self-consistent schemes including approximations to exchange and correlation proposed by Kohn and Sham are applied to computing atomic energies and densities. These quantities, with and without the correlation correction, are obtained and compared with the results of calculations using the Slater exchange hole or the Hartree-Fock method and with experimental values. The present method, without correlation, gives slightly better results for energies and substantially better results for densities than Slater's method. This was anticipated in the general theory. The correlation corrections of the present scheme are not very good, presumably due to the fact that the electronic density in atoms has too rapid a spatial variation. (Author)

AD-623 664 Div. 4/4
CFSTI Prices: HC $2.00 MF $0.50
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF PHYSICS
THE IONIZATION OF METHANE AND METH-

YL HALIDES USING ELECTRON AND ION IMPACT.
Scientific rept.,
by H. Sjogren. 10 Sep 65, 32p. Rept. no. SR-3
Contract AF61 052 762
AFCRL , 65-776

Unclassified report

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Descriptors: (*Gas ionization, Ionization potential), (*Methane, Ionization potentials), (*Halogenated hydrocarbons, Ionization potentials), Chlorine compounds, Iodine compounds, Electron bombardment, Ion bombardment, Chemical reactions, Mass spectroscopy, Atomic orbitals, Ionization chambers, Pressure, Dissociation, Sweden

The ionization efficiency curve for CH4 was measured using the RPD technique. No break corresponding to the ionization of a /sa1/ electron is observed. Determination of the mass spectrum using charge exchange at different pressures indicates that the earlier value of the ionization potential, 19.4 eV, is probably due to ion-molecule reactions in the ion source. A tentative value of 24 eV is proposed in better agreement with theory. The breakdown graph of CH3C1 was determined by use of charge exchange. Pressure dependence studies of the CH3C1 and CH31 mass spectra, obtained in the same way, indicate that earlier determinations of the ionization potentials of the /sa1/ electrons of these molecules might also be due to ion-molecule reactions in the ion source. (Author)

AD-623 089 **See Fld. 7/3**

AD-623 182 **See Fld. 6/1**

AD-623 185 **See Fld. 7/2**

AD-623 198 **See Fld. 20/13**

AD-623 254 **See Fld. 20/8**

AD-623 281 **See Fld. 12/1**

AD-623 402 **See Fld. 21/2**

AD-623 660 **See Fld. 10**

8/2. CARTOGRAPHY

AD-623 273 Div. 2/4 ,2/6
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
REPORT OF INVESTIGATIONS IN THE FIELD OF GRAVIMETRY, CONDUCTED IN THE USSR IN 19621965,
by Yu. D. Bulankhe, and L. P. Pellinen. 20 Oct 65, 31p. Rept. no. ftd-TT-65-1559
TT , 65-64469

Unclassified report

Unedited rough draft trans. of mono. Soobshchenie ob Issledovaniyakh v Oblasti Gravimetrii, Vypolnennykh v SSR v 1962-1965, n.p. 1965 26p.

Descriptors: (*Gravity, USSR), (*Geodesics, USSR), Instrumentation, Geophysics, Bibliographies

AD-623 442 Div. 2/4 ,2/1
CFSTI Prices: HC $2.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
STOKES' FORMULA FOR THE CASE OF AN ELLIPSOIDAL LEVEL SURFACE,
by D. V. Zagrebin. Aug 65, 46p. Rept. no. TC-929
TT , 65-64329

Unclassified report

Ellipsoidalnoi Urovennoi Poverkhnosti, Formula Stoksa dlya Sluchaya trans. of Akademiya Nauk SSSR. Institut Teoreticheskoi Astronomii. Byulleten, n52 p407-35 1941. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ellipsoids, Potential theory), (*Geodesics, Ellipsoids), Gravity, Series, Complex numbers, USSR

AD-623 451 Div. 2/4
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
ON THE PRACTICAL COMPUTATION OF THE QUASIGEOIDAL CHARACTERISTICS APPLYING MOLODYENSKY'S FORMULAE IN THE FIRST APPROXIMATION,
by Milan Bursa. Jun 65, 17p. Rept. no. TC-876
TT , 65-64312

Unclassified report

Trans. of Studia Geophysica et Geodaetica (Czechoslovakia) v8 p109-19 1964. (K Voprosu Opredeleniya Kharakteristik Kvasigeoida po Forulam Molodenskogo Pervogo Priblizheniia).

Descriptors: (*Geodesics, Numerical analysis), Corrections, Terrain, Gravity, Integral equations, Series, Czechoslovakia

AD-623 661 Div. 2/2 ,30/2
CFSTI Prices: HC $6.00 MF $1.25
PENNSYLVANIA RESEARCH ASSOCIATES INC PHILADELPHIA
INVESTIGATION OF DIGITAL CARTOGRAPHIC TECHNIQUES.
Final rept. for Apr 64-May 65.
Oct 65, 242p. Contract AF30 602 3393 Proj. 5569 Task 556903
RADC , TR-65-191

Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Mapping, Data processing systems), (*Data processingsystems, Mapping), (*Information retrieval, Mapping), (*Digital computers, Mapping), Maps, Production, Programming (Computers), Feasibility studies

An investigation has been conducted into the feasibility and practicality of developing digital techniques for consolidation and reduction to a common data base of all information required for the production of charts and allied products. To explore this question a conceptual system (the Universal Cartographic Data Base) was defined and developed sufficiently to provide a basis for evaluation. Development of the UCDB entailed system analysis, programming research and experimentation with sample programming techniques. Evaluation of the UCDB indicates that the concept is both technically and economically feasible. (Author)

AD-623 426 **See Fld. 8/14**

AD-623 437 **See Fld. 8/14**

AD-623 449 **See Fld. 8/6**

AD-623 669 **See Fld. 3/1**

AD-623 684 **See Fld. 3/1**

8/6. GEOGRAPHY

AD-623 252 Div. 2/5 ,2/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
METEORITICS.
AID Work assignment no. 35, task 38.
2 Jun 64, 15p. Rept. no. AID-U-64-51
TT , 65-64463

Unclassified report

Compilation of abstracts from the Estonian Journal Transactions of the Institute of Geology, no. 11 - Meteoritics. Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Meteorites, Bibliographies), Celestial mechanics, Extraterrestrial topography, Petrology, Minerals, Geochemistry, Abstracting, USSR

AD-623 421 Div. 2/5 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
TETONIC STRUCTURE OF THE ALDAN SHIELD BASEMENT, AS INTERPRETED ON THE BASIS OF LARGE-SCALE AIRBORNE MAGNETIC SURVEY DATA,
by A. I. Krasnov. Feb 65, 19p. Rept. no. TC-882
TT , 65-64314

Unclassified report

(O Tektonicheskom Stroenii Fundamenta Aldanskogo Shchita v Svete Geologicheskoi Interpretatsii Dannykh Krupnomasshtabnoi Aeromagnitnoi s'Emki) Trans. of Sovetskaya Geologiya (USSR) v7 n11 p61-71 1964.

Descriptors: (*Structural geology, USSR), (*Magnetometers, Surveying), Airborne, Magnetism, Terrestrial magnetism

AD-623 422 Div. 2/5 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
APPLICATION OF AIRBORNE MAGNETIC SURVEY DATA IN STUDYING THE ARCTIC BASIN OF THE EARTH'S CRUST,
by V. E. Volk. Mar 65, 9p. Rept. no. TC-883
TT , 65-64315

Unclassified report

(Opyt Ispol'sovaniya Dannykh Aeromagnitroi s"Emki Dlya Izucheniya Zemnoi Kori v Predelakh Arkticheskogo 'Basseina) Trans. of Sovetskaya Geologiya (USSR) v7 n11 p117-20 1964.

Descriptors: (*Structural geology, Arctic regions), (*Arctic regions, Structural geology), (*Magnetometers, Surveying), Airborne, Lithosphere, Terrestrial magnetism

AD-623 425 Div. 2/5 ,2/6 ,2/8
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
STRUCTURE OF THE PRE-CAMBRIAN BASE OF THE AREA SITUATED ON THE LEFT BANK OF THE MIDDLE FLOW OF THE DNEPER RIVER (ACCORDING TO THE DATA OF GEOPHYSICAL INVESTIGATIONS),
by L. O. Krutykhovska. Apr 65, 21p. Rept. no. TC-894
TT , 65-64317

Unclassified report

(Strukturi Dokembriyskogo Fundamentu Livoberezhya Seredn'ogo Pridniprovya (za Danimi Geofizychnykh Doslidzhen') Trans. of Geologichnyi Zhurnal (USSR) v18 n6 p70-83 1958. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Geological survey, USSR), (*Structural geology, USSR), Geophysical prospecting, Terrestrial magnetism, Gravity, Petrology, Geophysics, Rivers, Economic geology

AD-623 428 Div. 2/5 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
MAGNETOMETRY IN OIL PROSPECTING IN THE UKRAINIAN SSR,
by D. G. Bronshtein. Apr 65, 11p. Rept. no. tc-904
TT , 65-64320

Unclassified report

Magnitometriya pri Poiskach Nefti v USSR, trans. of mono. Neftyanoi Konferentsiya (Transactions of the Oil Conference), n. p., 1938. Trudy, 1939 p179-86. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geophysical prospecting, USSR), (*Magnetometers, Geophysical prospecting), Oils

AD-623 440 Div. 2/5
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
RESULTS OF EXPERIMENTAL WORKS BY THE METHOD OF TELLURIC CURRENTS IN THE KARTLIYSKAYA PLAINLAND),
by A. V. Bukhnikashvili, V. V. Kebuladze, and A. S. Lashkhi. Jun 65, 19p. Rept. no. TC-908
TT , 65-64323

Unclassified report

Rezultati Opytnykh Rabot Metodom Zemnykh Electricheskikh Tokov v Kartliiskoi Ravnine, trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Institut Geofiziki. Trudy, v18 p31-42 1959. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. (Copy is not available for public sale).

Descriptors: (*Geophysical prospecting, USSR), (*Geological survey, USSR), Earth, Electric currents, Petrology, Structural geology, Geophysics

AD-623 443 Div. 2/5
CFSTI Prices: HC $3.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
STRUCTURE OF THE EARTH'S CRUST,
by V. G. Bondarchuk. Apr 65, 53p. Rept. no. TC-846
TT , 65-64303

Unclassified report

Trans. of mono Struktura Zemnoi Kori, Kiev, 1962 43p Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Lithosphere, Structural geology), (*Structural geology, Lithosphere), Petrology, Phase studies, USSR

AD-623 447 Div. 2/5 ,2/10
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
STRUCTURE OF THE EARTH'S CRUST OF SIBERIA AND THE FAR EAST, ACCORDING TO THE DATA OF REGIONAL GEOPHYSICAL SURVEYS,
by E. E. Fotiadi, and G. I. Karataev. Oct 64, 24p. Rept. no. TC-853
TT , 65-64309

Unclassified report

(Stroenie Zemnoi Kory Sibiri i Dal'nego Vostoka po Dannym Regional'nykh Geofizicheskikh Issledovanii) Trans. of Geologiya i Geofizika (USSR) n10 p5-18 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Structural geology, Siberia), (*Siberia, Structural geology), (*Far East, Structural geology), Seismology, Geophysical prospecting

AD-623 449 Div. 2/5 ,2/2
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
THE FIRST INTERNATIONAL TECTONIC MAP OF THE WORLD,
by A. A. Bogdanov, G. B. Udintsev, V. E. Khain, and S. V. Chernook. Mar 65, 12p. Rept. no. TC-881
TT , 65-64313

Unclassified report

(K Proektu Sozdaniya Pervoi Mezhdunarodnoi Tektonicheskoi Karti Zemli) Trans. of Sovetskaya Geologiya (USSR) v7 n11 p99-105 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Structural geology, Maps), (*Maps, Structural geology), USSR

AD-623 453 Div. 2/5
CFSTI Prices: HC $4.00 MF $1.00
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
GEOPHYSICAL STUDIES OF THE CRUSTAL STRUCTURE IN THE EAST ANTARCTICA,
by S. A. Ushakov. Jun 65, 142p. Rept. no. TC-862
TT , 65-64311

Unclassified report

(Geofizicheskie Issledovaniya Stroeniya Zemnoi Kory v Vostochnoi Antarktide) Trans. of mono. Rezul'tati Issledovanii po Programme Mezhdunarodnogo Geofichcheskogo Goda, Moscow, 1963 93p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Structural geology, Polar regions), (*Polar regions, Structural geology), Lithosphere, Geophysical prospecting, Glaciers, Geophysics, USSR

A brief historical review of geological and geophysical research of the Antarctic continent is given. Methods of seismic, gravimetric and geomagnetic observations conducted by the First-the Fifth Soviet Antarctic Expeditions are described. The thickness of the Earth's crust in the East Antarctica is determined according to Bouguer anomalies. It is found that the thickness of the crust about 35 km is prevailing on the larger part of the investigated territory and this is characteristic of a platform structure of the region. Some sections of the platform have undergone a considerable activization in the recent geological time. The activized sections are grouped into two types according to the thickness of the crust: (1) Sections the activization of which was not accompanied by an increase of the crust's thickness. These are located mainly in the peripheral zone of the East Antarctic platform. (2) Sections the acticization of which was accompanied by a considerable increase (up to 55 km) of the Earth's crust. These constitute the Gambourtsev Mountains.

AD-623 608 Div. 2/5 ,18/2 CFSTI PricesMF $0.50
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
ENVIRONMENTAL DATA COLLECTION MANUAL. VOLUME V. SURFACE MICROGEOMETRY.
Instruction rept.
Sep 65, 35p. Rept. no. IR-6

Unclassified report

Hard copy available from Waterways Experiment Station, $0.50.

Descriptors: (*Terrain, Data), Surfaces, Soils, Plants (Botany), Trafficability, Measurement, Configuration, Site selection, Instrumentation, Instruction manuals

Detailed instructions are given for the field collection of data describing the configuration of small surface geometry features. Instructions on site selection and the use of relevant instruments are also given. (Author)

AD-623 106 See Fld. 8/11

AD-623 179 See Fld. 8/10

AD-623 318 See Fld. 8/7

AD-623 319 See Fld. 8/7

AD-623 423 See Fld. 8/14

AD-623 424 See Fld. 8/14

AD-623 426 See Fld. 8/14

AD-623 427 See Fld. 8/14

AD-623 429 See Fld. 8/7

AD-623 431 See Fld. 8/14

AD-623 432 See Fld. 13/13

AD-623 445 See Fld. 8/14

AD-623 446 See Fld. 8/14

8/7. GEOLOGY AND MINERALOGY

AD-623 318 Div. 2/8 ,2/5 ,2/9
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
A MAGNETIC MINERAL FROM THE INDIAN OCEAN,
by C. G. A. Harrison, and M. N. A. Peterson. 19 Oct 64, 10p. Contract Nonr221605 Grant ,NSF GP489

Unclassified report

Pub. in American Mineralogist v50 p704-12 May-Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Magnetic materials, Minerals), (*Minerals, Magnetic materials), (*Indian Ocean, Minerals), Economic geology, Marine geology, Ocean bottom sampling, Petrology, Geochemistry

A high concentration of a magnetic mineral was found near the top of two cores from the Indian Ocean. Magnetic properties of the sediment suggest an in situ formation. X-ray and magnetic data show that the mineral is between magnetite and maghemite in structure, and the formation of such a mineral in the deep sea environment is considered. (Author)

AD-623 319 Div. 2/8 ,2/6 ,2/5
SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB
PRELIMINARY MEASUREMENTS OF THE ANISOTROPY OF MAGNETIC SUSCEPTIBILITY OF THE FRANCISCAN FORMATION OF CENTRAL CALIFORNIA,
by A. I. Rees. 1965, 6p. Contract Nonr221605 Grant ,NSF GP111

Unclassified report

Pub. in Geological Society of American Bulletin v76 p975-80 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Petrology, California), (*Structural geology, California), Rock (Geology), Magnetic properties, Anisotropy, Paleontology, Terrestrial magnetism

A preliminary collection has been made of oriented rock samples from the Franciscan formation near San Jose, California. Measurement of the anisotropy of their magnetic susceptibility suggests that this method may be used in obtaining a large number of estimates of preferred grain orientation, which may be useful in paleogeographic reconstruction. (Author)

AD-623 429 Div. 2/8 ,2/6 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
EXPERIMENT IN USING GEOPHYSICAL METHODS FOR THE PURPOSE OF GEOLOGICAL MAPPING OF THE CRYSTALLINE FOUNDATION OF THE KURSK MAGNETIC ANOMALY,
by N. G. Shmidt. May 65, 19p. Rept. no. TC-905
TT , 65-64321

Unclassified report

Opyt Primeneniya Geofizicheskikh Metodov Dlya Tseley Geologicheskogo Kartirovaniya Kristallicheskogo Fundamenta Kurskoi Magnitnoi Anomalii (KMA), trans. of Sovetskaya Geologiya (USSR) n58 p138-49 1957. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geophysical prospecting, USSR), (*Petrology, Geophysical prospecting), (*Terrestrial magnetism, USSR), Economic geology, Minerals, Metamorphic rock, Igneous rock, Structural geology, Mapping, Geological survey

AD-623 444 Div. 2/8
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
DENSITY CHARACTERISTICS OF SEDIMENTARY DEPOSITS IN THE CIS-CAUCASIAN AREA,
by R. F. Volodarskii. 1965, 15p. Rept. no. TC-850
TT , 65-64307

Unclassified report

Plotnostnaya Charakteristika Osadochnykh Otlozhenii Predkavkazya, trans. of Razvedochnaya i Promyslovaya Geofizika (USSR) v51 p59-67 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Petrology, USSR), (*Sedimentary rock, Density), Stratigraphy, Well logging, Geology

AD-623 501 Div. 2/8 ,25/6
CHICAGO UNIV ILL DEPT OF GEOLOGY
THE MICROCLINE-SANIDINE STABILITY RELATIONS,
by Julian R. Goldsmith, and Fritz Laves. 3 Oct 53, 23p. Contract N6ori2021 Proj. NR081 014

Unclassified report

Pub. in Geochimica et Cosmochimica Acta (Gt. Brit). v5 n1 p1-19 1954 (Copies available only to DDC users).

Descriptors: (*Minerals, Phase studies), (*Feldspar, Phase studies), Potassium compounds, Aluminum compounds, Silicates, X-ray diffraction analysis, Transformations, Solid solutions, Chemical precipitation, Alloys, Crystal structure, Heat treatment, Gems (Minerals)

States that are structurally intermediate between the triclinic and monoclinic modifications of $KAlSi_3O_8$ are described and discussed with relation to order-disorder in alloys. X-ray powder diffraction data on microcline are given. Intermediate states were produced by heating microcline well above the temperature of its inversion to sanidine. These states could not be produced in the approximate range of the transition, either by dry heating, or hydrothermally. Microcline is readily converted to sanidine, however, under hydrothermal conditions at temperatures well below those necessary in the dry state. The lowest temperature observed for the hydrothermal conversion of a microcline to sanidine was 525C. The hydrothermal conversion takes place by a mechanism that differs from that of the simple diffusive transformation that occurs when microcline is heated dry above ca. 1000C. The mechanism of this conversion, which involves solution of microcline and re-precipitation of sanidine is discussed. Some doubt is cast on the validity of using this type of conversion in placing transformation temperatures in the alkali feldspar system. (Author)

AD-623 423 **See Fld. 8/14**

AD-623 424 **See Fld. 8/14**

AD-623 425 **See Fld. 8/6**

AD-623 427 **See Fld. 8/14**

8/10. PHYSICAL OCEANOGRAPHY

AD-623 136 Div. 2/9 ,9/4
CFSTI Prices: HC $2.00 MF $0.50
SERVICE BUREAU CORP NEW YORK
WATER WAVE RUN-UP ON A BEACH, II,
by Joseph B. Keller, and Herbert B. Keller. 1965, 41p. Contract Nonr382800 Proj. NR083 169

Unclassified report

See also AD-608 864.

Descriptors: (*Water waves, Beaches), (*Beaches, Water waves), Hydrodynamics, Ocean waves, Seacoast, Tides, Boundary valve problems, Harmonic analysis

AD-623 179 Div. 2/9 ,2/5
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
LATE QUATERNARY HISTORY, CONTINENTAL SHELVES OF THE UNITED STATES,
by Joseph R. Curray. 20 Oct 65, 16p. Contract Nonr221623 Proj. NR083 005

Unclassified report

Pub. in The Quaternary of the United States p723-35 1965 (Copies not available to DDC or Clearinghouse customers). Review volume for the Congress of the International Association for Quaternary Research (7th).

Descriptors: (*Marine geology, Seacoast), (*Seacoast, Marine geology), Atlantic Ocean, Mexico Gulf, Pacific Ocean, Sedimentation, Stratigraphy

AD-623 180 Div. 2/9 ,19/3
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
OCEANOGRAPHIC APPLICATION OF VERY LOW FREQUENCY RADIO NAVIGATION IN THE INDIAN OCEAN,
by Maxwell Silverman. 19 Oct 65, 15p. Contract Nonr221623 Proj. NR083 005

Unclassified report

Pub. in Ocean Science and Ocean Engineering p320-33 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Transactions of the Joint Conference, Marine Technology Society and American Society of Limnology and Oceanography, Washington, D. C., Jun 1965.

Descriptors: (*Hydrographic surveying, Radio navigation), (*Radio navigation, Hydrographic surveying), (*Oceanographic equipment, Radio navigation), Very low frequency, Radio waves, Ionospheric propagation, Phase measurement, Position finding, Oceanology, Indian Ocean

VLF Radio Navigation equipment similar to that used in the Atlantic in 1963 on R/V ATLANTIS II was employed in the central and eastern Indian Ocean regions in the fall of 1964 on R/V ARGO. The distance of the vessel from the respective VLF transmitters was as great as 9,000 miles as contrasted to the 500 to 5,000 mile range on the Atlantic voyage, yet the mean deviation from the respective astronomic position was approximately nine miles, comparing favorably with the five mile deviation in the Atlantic. It was found that positions could be obtained within the mean deviation at any interval within a 24 hour day even under those atmospheric conditions causing phase reversals and phase anomalies. These effects and diurnal phase shifts can be compensated in the position calculation procedure; however, at least three VLF stations must be monitored constantly and comparisons made with a well kept dead reckoning plot. On an oceanographic cruise where the vessel is engaged in random speed and course changes and station stops for varying time periods an expansion of errors occurs which is greater than if the track is relatively constant. This effect is evaluated, particularly in the area of obtaining vessel drift while on an oceanographic station. (Author)

AD-623 223 Div. 2/9
CFSTI Prices: HC $4.00 MF $0.75
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
REGIONAL OCEANOGRAPHY,
by A. K. Leonov. 1965, 121p. Rept. no. trans. 193
TT , 65-64445

Unclassified report

Trans. of mono. Regional'naya Okeanografiya, Leningrad, 1960, Pt. 1 p663-712, 728-748, 752-65.

Descriptors: (*Black Sea, Oceanographic data), (*Oceanology, Black Sea), Hydrology, Chemical properties, Thermal properties, Physical properties, Economics, Marine biology, USSR

Contents: Water balance of the Black Sea; Processes of intermixing in the Black Sea and their hydrological consequences; Water masses of the Black Sea; Thermics of the Black Sea; Salinity of the Black Sea Water; Density of Black Sea water; Basic data on the chemistry of the Black Sea; Vertical and geographical distribution of hydrochemical elements in the Black Sea; and Main aspects of the economical utilization of the Black Sea.

AD-623 225 Div. 2/9 ,2/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
TURBULENT WATER FLOW PATTERNS RESULTING FROM WIND STRESS ON THE OCEAN,
by Kingsley G. Williams. 1965, 20p. Rept. no. NRL Memo. Rept. 1653
Unclassified report

Descriptors: (*Ocean currents, Wind), (*Wind, Ocean currents), Oceans, Surface properties, Fluid flow, Flour visualization, Aluminum, Powders, Configuration, Turbulence

The distribution of aluminum powder on the sea surface as a result of flow arising from wind stress indicates an increasing orderliness of distribution with time. Most of the powder tends to collect into well defined streaks oriented in the direction of the wind. Characteristic spacings observed were about 15 feet, though indications of larger spacings were also observed. The behavior of the powder points toward a turbulent system in which cell dimensions are randomly distributed except for a particular spatial frequency which seems to be selectively stabilized. On the basis of these results, additional experiments are being planned to clarify the relationships between the observed patterns, wind velocity, variation of mean water velocity and direction with depth and windrow spacings. (Author)

AD-623 255 Div. 2/9 ,9/1 ,24/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
THE CALCULATION OF THE TWO-DIMENSIONAL ENERGY SPECTRUM ACCORDING TO STERO PHOTOGRAPHIC DATA (RASCHET DVUKHMERNOGO ENERGETICHESKOGO SPECKTRA PO DANNYM STEREOFOTOS YEMKI VOLNENIYA),
by G. V. Matushevskii, and S. S. Strekalov. 1965, 14p. Rept. no. trans-234
TT , 65-64465
Unclassified report

Trans. of Okeanologiya (USSR) v3 n5 p840-7 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ocean waves, Photographic analysis), (*Stereoscopic photography, Ocean waves), Aerial photography, Water waves, Hydrodynamics, Numerical methods and procedures, Oceanology, USSR

The study discusses one of the calculation methods used in the evaluation of two extensive series of aerial stereo photographs of waves in deep water. Some of the qualitative characteristics of the two-dimensional energy spectrum are determined. According to the method, which is based on studies by Marks and Krylov, the waves on the sea surface are considered as additions of an infinitely great number of harmonics with various amplitudes, frequencies, directions and random phases which are defined by mathematical formulae. (Author)

AD-623 257 Div. 2/9 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
THE HEIGHT AND PERIOD OF WAVE MOTION IN THE NORTHERN NORTH ATLANTIC OCEAN (HOHE UND PERIODE DES SEEGANGES IM NORDLICHEN NORDATLANTISCHEN OZEAN),
by Hans Walden. 1965, 5p. Rept. no. trans-270
TT , 65-64467
Unclassified report

Trans. of Deutsche Hydrographische Zeitschrift (West Germany) v17 n5 p232-5 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ocean waves, Hydrodynamics), (*Atlantic Ocean, Ocean waves), Oceanographic data, Marine engineering, West Germany

AD-623 448 Div. 2/9
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
ANALYSIS OF THE DEPENDENCE ON DEPTH OF ANOMALIES IN OCEANIC AREAS,
by N. P. Grushinskii. Sep 65, 20p. Rept. no. TC-949
TT , 65-64335
Unclassified report

(Analiz Zavisimosti Anomalii Dlya Okeanicheskikh Oblastei ot Glubini) Trans. of Moscow Univ. Vestnik. Seriya 3: Fizika, Astronomiya (USSR) v15 n5 p81-93 1960. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Gravity, Oceanographic data), (*Oceanographic data, Gravity), Depth indicators, Ocean bottom, USSR

The ocean, as a whole, has different value of anomalies, however, small anomalies within the limits of -35 - +10 mgals prevail. A value in the order of -25 mgals can be accepted as the mean anomaly. There are only few considerable anomalies. The number of points, with the given value of the anomaly, rapidly decreases in proportion to the increase of the anomaly. Against a background, closely related to the accidental distribution of anomalies, a dependence of anomalies on depth, in the order of -11 mgals per 1000m, occurs. In proportion to the increase of depth, the number and absolute' value of negative anomalies increase till the complete disappearance of positive anomalies at great depths (in the order of 6000m). After establishing the dependence of anomalies on depth, and evaluating the degree of deviation of actual anomalies from this dependence, it is appropriate to examine the possibility of using gravity anomalies for the determination of the sea depth, as well as for the evaluation of anomalies of gravitationally non-investigated regions, with respect to known depths. The problem of the dependence of anomalies on depth is important, for instance, for studies of the thickness of glaciers. Equally important is the problem of the determination of anomalies relative to depth.

AD-623 473 Div. 2/9
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
ON THE EXISTENCE OF THE SEAMOUNT KNOWN AS AMERICAN SCOUT.
Technical rept.,
by Richard H. Backus, and L. V. Worthington.
6 Apr 65, 8p. Rept. no. ref ,65-55
Contract Nonr402900 ,Nonr219600
Unclassified report

Pub. in Deep-Sea Research v12 p457-60 1965 (Copies available only to DDC users).

Descriptors: (*Mountains, Ocean bottom topography), (*Marine geology, Atlantic Ocean), (*Atlantic Ocean, Marine geology), Bathythermograph data, Hydrographic surveying, Hydrographic sonar, Navigation charts

Discussion of submarine mountains in the North Atlantic Ocean.

AD-623 194 See Fld. 8/11

AD-623 256 See Fld. 6/3

AD-623 318 See Fld. 8/7

AD-623 352 See Fld. 13/10

AD-623 512 See Fld. 8/11

8/11. SEISMOLOGY

AD-623 106 Div. 2/10 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
STRUCTURE OF THE UPPER PART OF THE EARTH'S MANTLE FROM OBSERVATIONS OF EARTHQUAKES WITH INTERMEDIATE DEPTHS OF FOCUS,
by A. A. Lukk, and I. L. Nersesov. 19 Oct 65, 9p. Rept. no. ATD-T-65-89
TT , 65-64336
Unclassified report

Trans. of Akademiya Nauk SSSR. Doklady, v162 n3 p559-62 1965 (Stroenie Verknei Chasti Obolochki Zemli po Nablyudeniyam nad Zemletryaseniyami s Promezhutochnoi Glubinoi Ochaga).

Descriptors: (*Seismology, Lithosphere), (*Lithosphere, Seismology), (*Earthquakes, Asia), Seismic waves, Structural geology, USSR

A study of the earth's mantle was conducted on the basis of earthquakes occurring in the Pamir-Hindu Kush epicentral zone. In order to improve the accuracy of the determinations of the geometric coordinates of the foci, five temporary seismic stations were set up in the immediate epicentral zone. Elastic vibrations were registered on a profile of stations passing through Central Asia, eastern Kazakhstan, and the Altay and Sayan Mountains to the Lena River. The average distance between stations was 70--100 km. The total length of the profile was 3500 km. Earthquake epicenters were determined by the K-epicentral method, which does not depend on knowledge of the velocity profile of the medium or the depth of the focus, and is in essence a somewhat modified theoretical travel-time method.

AD-623 184 Div. 2/10 ,6/7
CFSTI Prices: HC $1.00 MF $0.50
VELA SEISMIC INFORMATION ANALYSIS CENTER UNIV OF MICHIGAN ANN ARBOR
VESIAC MONTHLY BULLETIN OF VELA UNIFORM RESEARCH PUBLICATIONS.
15 Sep 65, 8p. Rept. no. bull-32
Unclassified report

Descriptors: (*Seismology, Bibliographies), Seismic waves, Propagation, Geology, Earth-

quakes, Nuclear explosions, Identification systems

Bibliography of seismological research publications.

AD-623 194 Div. 2/10 ,2/9
CFSTI Prices: HC $1.00 MF $0.50
HAWAII INST OF GEOPHYSICS HONOLULU
AN EVALUATION OF THE VIBROTRON PRESSURE TRANSDUCER AS A MID-OCEAN TSUNAMI GAGE,
by M. J. Vitousek. Aug 65, 24p. Rept. no. HIG-65-13
Contract Nonr374803 Proj. NR083 168
Unclassified report

Descriptors: (*Earthquake warning systems, Pressure gages), (*Ocean waves, Earthquakes), (*Pressure gages, Earthquake warning systems), (*Transducers, Earthquake warning systems), Underwater equipment, Vibrators (Electrical), Signal generators, Amplifiers, Electronic recording systems, Oceanographic equipment, Marine geophysics

Evaluation tests of the vibrotron absolute pressure transducer for detecting small pressure changes under a high ambient pressure were begun two years ago at the Hawaii Institute of Geophysics. This work has demonstrated the feasibility of using this instrument as a sensing element for a tsunami gage system which is bottom-mounted in oceanic depths. The methods of testing and the results are presented together with two possible instrument systems. A successful test in situ at a depth of 1500 meters is described. (Author)

AD-623 438 Div. 2/10
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
DISPERSION OF LOVE WAVES WITH A SINGLELAYER AND DOUBLE-LAYER MODEL OF THE EARTH'S CRUST,
by D. I. Sikharulidze. May 65, 25p. Rept. no. TC-911
TT , 65-64326
Unclassified report

Dispersiya Voln Lyava pri Odnosloinoi i Dvusloinoi Modeli Zemnoi Kori, trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Institut Geofiziki. Trudy, v18 p129-43 1959. Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Seismology, Earth models), (*Structural geology, Seismology), (*Earth models, Seismology), Mathematical models, Seismic waves, Propagation, Lithosphere, Theory, Experimental data, USSR

Results of experimental investigations of dispersion of Love waves obtained directly from seismogram analysis are used in the study of the earth crust. Interpretation of observed dispersion and speeds is conducted on the basis of comparison of theoretic and experimental dispersing curves. During construction of theoretical dispersion curves it is necessary to proceed from an assumed scheme of the earth crust structure. Without a number of theoretical curves for all the possible variations of the structure of the earth crust a reliable interpretation of experimental data is impossible. On the basis of the results of a number of investigations it has been determined that the structure of the earth crust varies in various sections of the earth. As it has been proved by investigations, schematically the continental crust may be imagined as basically consisting of granitic and basaltic layers. In certain sections of the continental part of the earth the sedimentary layer is of importance in the crust's structure. In some places its thickness reaches ten and more kilometers. During construction of theoretical dispersion curves the earth crust is modeled as a single-layered or double-layered medium located in the space. Each medium is considered to be uniform. Possible variations of elastic medium parameter relations are investigated for such models. (Author)

AD-623 512 Div. 2/10 ,2/9
CFSTI Prices: HC $2.00 MF $0.75
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
30-DAY OCEAN-BOTTOM SEISMOGRAPH, ALEUTIANKURILE OPERATIONS.
Final rept. for 1 Oct 64-31 Aug 65,
by Patrick J. Farrell, and William A. Schneider.
31 Oct 65, 37p. Contract AF19 628 4075 Proj. 8652 ,ARPA Order 292 Task 865205
AFCRL , 65-765
Unclassified report

Descriptors: (*Seismographs, Underwater equipment), (*Oceanographic equipment, Seismographs), Marine geophysics, Pacific Ocean, Aleutian Islands, Japan, Seismology, Ocean bottom, Instrumentation, Data storage systems, Transducers, Magnetic recording systems

The 30-day ocean-bottom seismograph senses ground motion through 1 vertical and 2 horizontal velocity seismometers and pressure variations through a transducer capable of response to 1.0 cps. Data are recorded continuously on magnetic tape and the unit has a depth capability of 25,000 ft. During the summer and fall of 1964, several drops were made in the area south of the Aleutian chain and northeast of the Island of Hokkaido, Japan. Power density spectra of ambient noise samples over a long time interval were selected from the two areas. Plots of these data vs time are presented and compared with simultaneous meteorological maps covering the respective areas. These results show a direct relationship between ambient noise levels and local meteorological changes. In fact, lowpressure disturbances were observed to cause up to 20 db increase in ambient noise level in the 0-2.0 cps range. Ambient noise levels that previously were observed and reported appear consistent with current findings. (Author)

AD-623 554 Div. 2/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
THE RELATIONSHIP BETWEEN ATMOSPHERIC EXPLOSION PARAMETERS AND SEISMIC ENERGY,
by S. Ya. Kogan. 20 Oct 65, 22p. Rept. no. ATD-T-65-90
TT , 65-64489
Unclassified report

Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Fizika Zemli, n4 p9-22 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Seismology, Explosion effects), (*Explosion effects, Seismology), Explosions, Atmosphere, Surface area, Earth, Seismic waves, Dynamics, Correlation techniques, Geophysics, USSR

AD-623 592 Div. 2/10
CFSTI Prices: HC $1.00 MF $0.50
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
A BASIC STUDY OF ELASTIC WAVE PROPAGATION.
Final rept. for 28 Jun 63-31 Dec 64,
by James Dorman. 31 Dec 64, 8p. Contract DA31 124ARO D136 Proj. 20010501B700 AROD , 4120:2
Unclassified report

Descriptors: (*Seismic waves, Propagation), Seismology, Mechanical waves, Elasticity, Earthquakes, Underground explosions, Nuclear explosions, California, Nevada

Abstracts are given of the following publications: Relative excitation of surface waves by earthquakes and underground explosions in the California - Nevada region; Surface wave radiation patterns for underground nuclear explosions and small magnitue earthquakes; Use of surface wave rejection filters to record mantle waves of low order; Travel times, body waves, and dispersion in the earth; Travel times, body waves, and normal modes of the earth (AD-611 939).

AD-623 447 **See Fld. 8/6**

8/14. TERRESTRIAL MAGNETISM

AD-623 240 Div. 2/6 ,2/7 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PROBLEMS OF SPACE MAGNETISM, VAN ALLEN RADIATION BELTS, PLASMA IN SPACE, AND AURORAS.
Mar 64, 24p. Rept. no. AID-U-64-17
TT , 65-64451
Unclassified report

Review of Soviet publications.

Descriptors: (*Van Allen radiation belt, Plasma physics), (*Terrestrial magnetism, Plasma physics), (*Aurorae, Spectroscopy), Magnetohydradynamics, Space environmental conditions, Magnetic fields, Reviews, USSR

A review is given of Soviet publications concerned with the following topics: space magnetism measured from rockets and satellites, the Van Allen radiation belts, plasma in space, and auroras.

AD-623 423 Div. 2/6 ,2/8 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
GEOLOGIC INTERPRETATION OF SOME MAGNETIC ANOMALIES IN THE MINOR CAUCASUS,
by M. H. Mustafabeili, and B. E. Khesin. Mar 65, 14p. Rept. no. TC-884
TT , 65-64316
Unclassified report

K Voprosu Geologicheskoi Interpretatsii Nekotorykh Magnitnykh Anomaliti Malogo Kavkaza, trans of Sovetskaya Geologiya (USSR)n11 p108-13 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, USSR), (*Geophysical prospecting, USSR), Mountains, Structural geology, Petrology, Economic geology, Geological survey Airborne, Magnetometers, Geophysics

AD-623 424 Div. 2/6 ,2/8 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
KURSK MAGNETIC ANOMALIES,
by K. G. Bronshtein. May 65, 19p. Rept. no. TC-903
TT , 65-64319
Unclassified report

Kurskie Magnitnye Anomalii, trabs. of Mezhdunarodnyi Geologicheskii Kongress (17th), v4 p431-42 1948 (International Geological Congress (17th).

Descriptors: (*Terrestrial magnetism, USSR), (*Geophysical prospecting, USSR), Geological survey, Economic geology, Petrology, Well logging, Structural geology

AD-623 426 Div. 2/6 ,2/5 ,2/4
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
PROBLEMS OF THE THEORY AND METHOD OF GEOPHYSICAL INVESTIGATIONS, (SELECTED ARTICLES).
1965, 55p. Rept. no. TC-857
TT , 65-64310

Unclassified report

Voprosi Teorii i Metodiki Geofizicheskikh Issledovanii, trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n5 (7) p3-9 33-7 38-48 60-5 79-84 1963. Available copy will not permit fully legible reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Geophysics, USSR), (*Geophysical prospecting, Theory), (*Geodesics, USSR), Terrestrial magnetism, Gravity, Geological survey, Numerical methods and procedures

Contents: Relation between critical points of gravitational potential and the form of disturbing masses; Reflection of recent tectonic movements in the relief and emanation anomalies of the Krivay Rog part of ukrainian crystalline shield; relation between higher vertical derivaties of gravitational potential and horizontal gradients of the force of gravity; analytical method for division of anomalies; Certain problems in the method of geophysical surveys.

AD-623 427 Div. 2/6 ,2/8 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
MAGNETIC ANOMALIES OF THE DNIEPER-DONETS DEPRESSION AND THEIR GEOLOGIC INTERPRETATION,
by R. I. Andreeva. Apr 65, 20p. Rept. no. TC-895
TT , 65-64318

Unclassified report

Magnitni Anomalii Dniprovsko-Donetskoi Zapadyni ta Ikh Geologichne Tlumachenya, trans. of Geologichnyi Zhurnal (USSR) v18 n4 p61-70 1958. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geophysical prospecting, USSR), (*Terrestrial magnetism, USSR), Petrology, Structural geology, Gravity, Economic geology, Geological survey

AD-623 430 Div. 2/6 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
FLUXOMETRIC OBSERVATIONS OF GEOMAGNETIC FIELD VARIATIONS IN DUSHETI,
by G. P. Berishvili, and N. S. Khvedelidze. May 65, 9p. Rept. no. TC-907
TT , 65-64322

Unclassified report

O Fluksmetricheskikh Nablyudeniyakh Variatsii Geomagnitnogo Polya v Dusheti, trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Institut Geofiziki. Trudy, v18 p23-7 1959. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, Fluxmeters), (*Fluxmeters, Terrestrial magnetism), Geophysics, Measuring devices (Electrical+electronic), USSR

AD-623 431 Div. 2/6 ,2/5
CFSTI Prices: HC $2.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
OBSERVATIONS WITH THE EOTVOS TORSION BALANCE IN THE REGION OF THE KURSK MAGNETIC ANOMALIES,
by D. G. Uspenskii. Jun 65, 26p. Rept. no. TC-909
TT , 65-64324

Unclassified report

Nablyudeniya s Krutilnymi Vesami Eotvosa v Oblasti Kurkikh Magnitnykh Anomalii, trans. of Materialy: Geofizika, v1 p1-18 n. d. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, USSR), (*Geophysical prospecting, USSR), (*Gravity, USSR), Geodesics, Balances, Economic geology, Geophysics

AD-623 434 Div. 2/6
CFSTI Prices: HC $6.00 MF $1.25
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
MORPHOLOGY AND THE THEORY OF THE EARTH'S MAGNETIC FIELD AND ITS VARIATIONS,
by B. M. Yanovskii. Oct 65, 2p. Rept. no. TC-933
TT , 65-64331

Unclassified report

(Morfologiya i Teoriya Magnitnogo Polya Zemli i Ego Variatsii) Trans. of Mono. Zemnoi Magnetizm, n.p. 1964 v1 p23-193, 224-9. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, Configuration), Geophysics, Geodesics, Numerical methods+procedures, USSR

AD-623 435 Div. 2/6
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
FORMULAS FOR THE COMPUTATION OF THE DISTURBING POTENTIAL AND COMPONENTS OF THE DECLINATION OF THE PLUMB LINE ON THE TERRESTRIAL SURFACE,
by V. V. Brovar. Sep 65, 12p. Rept. no. TC-939
TT , 65-64332

Unclassified report

(O Formulakh dla Vychisleniya Vozmushchaiushchego Potentsiala i Sostavlyaiushchikh Otkloneniya Otvesa na Zemnoi Poverkhnosti). Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Geodeziya i Aerofostos'emka (USSR) n2 p97-104 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geodesics, Terrestrial magnetism), (*Terrestrial magnetism, Geodesics), Potential theory, Geophysics, USSR

AD-623 436 Div. 2/6
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
DOWNWARD ANALYTICAL CONTINUATION OF GRAVITY ANOMALIES AND DEPTH OF BURIAL ESTIMATE OF DISTURBING MASSES,
by O. A. Shvank. Sep 65, 6p. Rept. no. TC-941
TT , 65-64333

Unclassified report

(Analiticheskoe Prodolzhenie Anomalii Sili Tyazhesti Vniz i Otsenka Glubini Zaleganiya Vozmushchayushchikh Mass).

Descriptors: (*Geodesics, Isostatic change), (*Gravity, Isostatic change), (*Isostatic change, Geodesics), Structural geology, Geophysics, Correlation techniques

AD-623 437 Div. 2/6 ,2/2
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
WORLD MAPS OF ISOPORS FOR THE PERIOD OF 1954-1959,
by N. V. Adam, and V. P. Orlov. Sep 65, 18p. Rept. no. TC-942
TT , 65-64334

Unclassified report

(Mirovye Karti Izopor dlya Perioda 1954-1959) Trans of Akademiya Nauk SSSR. Institut Zemnogo Magnetizma, Ionosfery i Rasprostraneniya Radiovoln. Trudy, n18 (28) p14-26 1961. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Maps, Terrestrial magnetism), (*Terrestrial magnetism, Maps), Geophysics, Mapping, Geodesics, USSR

AD-623 441 Div. 2/6
CFSTI Prices: HC $3.00 MF $0.75
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
MAGNETIC FIELD OF THE ARARAT BASIN OF THE ARMENIAN S. S. R.,
by Ts. G. Akopyan. Jul 65, 63p. Rept. no. TC-918
TT , 65-64328

Unclassified report

Trans. of mono. Magnitoe Pole Araratskoi Kotlovini Armyanskoi S. S. R., Erevan, 1960 p70-128. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, USSR), Geodesics, Gravity, Structural geology, Geophysics, Maps

AD-623 445 Div. 2/6 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
USE OF THE METHOD OF TANGENTS WHILE INTERPRETING DELTA G CURVES OVER A VERTICAL TERRACE,
by Yu. A. Pavlov. Oct 64, 12p. Rept. no. TC-848
TT , 65-64306

Unclassified report

O Primenenii Metoda Kastelnykh pri Interpretatsii Krivykh Delta g Vertikal-nym Ustupom, trans. of Geologiya i Geofizika (USSR) n12 p109-13 1962. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geophysical prospecting, Projective geometry), (*Projective geometry, Geophysical prospecting), Geophysics, Structural geology, Gravity, Terrestrial magnetism, Isostatic change, USSR

The method of tangents is applied to determine the depth of occurence for the different elements

of the disturbing bodies with respect to the geophysical anomalies.

AD-623 446 Div. 2/6 ,2/5
CFSTI Prices: HC $2.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
RECENT CRUSTAL MOVEMENTS,
by E. N. Lyustikh. Jun 65, 44p. Rept. no. TC-852
TT , 65-64308

Unclassified report

Sovremennye Dvizheniya Zemnoi Kori, Collection of Articles, No. 1, Moscow, 1963 p33-7 224-44 245-9.

Descriptors: (*Lithosphere, Isostatic change), (*Orogeny, Isostatic change), (*Isostatic change, Orogeny), Structural geology, Geophysics, Gravity, USSR

Investigation of the causes of vertical movements taken into consideration gravitational factors.

AD-623 654 Div. 2/6
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE CORP SAN BERNARDINO CALIF
ON DERIVATIONS AND PROPERTIES OF STOKES' GRAVITY FORMULA,
by Leendent de Witte. May 65, 38p. Rept. no. TDR-469 (S5230-37)-1
Contract AF04 695 469
BSD , TR-65-463

Unclassified report

Descriptors: (*Gravity, Potential theory), Geodesics, Integrals, Harmonic analysis, Spheres, Geography

Several independent derivations of Stokes gravity formula were critically analyzed. It is shown that a 'revised' Stokes formula derived by R. A. Hirvonen is not valid for gravity data given on an arbitrary surface as claimed, but only for data given on a sphere as in the original Stokes formula. In derivations based on Poisson's integral theorem a more rigorous treatment of the elimination of zeroth and first order terms of anomalous gravity was presented. The influence of remote zones in the applications of Stokes' formula was evaluated by numerical integration. It is shown that tremendous truncation errors occur unless the integration is extended over the entire globe. The differences in truncation error behavior for different geographical locations are so large that data representing world-wide average behavior may be very misleading when applied to individual locations. The lack of gravity data coverage over very large parts of the globe causes significant errors in geoidal height determinations and vertical extensions of anomalous gravity by Stokes' formula. (Author)

AD-623 681 Div. 2/6 ,2/1 ,25/3
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
SOLAR PLASMA WIND, EARTH CURRENTS AND DIURNAL MAGNETIC-FIELD VARIATIONS.
Environmental research papers,
by H. Poeverlein. Aug 65, 12p. Rept. no. ERP-125
Proj. 5631 Task 563110
AFCRL , 65-599

Unclassified report

Pub. in Nature v206 n4984 p604-5 May 8 1965 (Copies available only to DDC users).

Descriptors: (*Solar wind, Magnetohydrodynamics), (*Terrestrial magnetism, Diurnal variations), (*Magnetohydrodynamics, Upper atmosphere), (*Upper atmosphere, Magnetohydrodynamics), Earth, Magnetic fields, Electric fields, Geophysics, Astrophysics, Plasma physics

Mead has derived the diurnal magnetic-field variations caused by the solar plasma wind under the assumption of a resting magnetosphere Corotation of the magnetosphere with the earth and deformation by the solar plasma wind lead to hydromagnetic processes in the magnetosphere. The accompanying electric field strength causes earth currents, which enhance the variations of the diurnal magnetic field and make them better agreeing with observed variations. Land-sea effects are briefly discussed. (Author)

AD-623 113 See Fld. 3/1

AD-623 273 See Fld. 8/2

AD-623 319 See Fld. 8/7

AD-623 421 See Fld. 8/6

AD-623 422 See Fld. 8/6

AD-623 425 See Fld. 8/6

AD-623 428 See Fld. 8/6

AD-623 429 See Fld. 8/7

AD-623 598 See Fld. 4/2

AD-623 632 See Fld. 20/8

9/1. COMPONENTS

AD-623 101 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
PARALLEL L-C TUNED CIRCUIT EMPLOYING A LIGHT-VARIABLE CAPACITOR.
Master's thesis,
by Joseph Charles Wheeler. Aug 65, 83p. Rept. no. GE/EE/65-25

Unclassified report

Descriptors: (*Tuned circuits, Variable capacitors), (*Variable capacitors, Semiconductor devices), (*Semiconductor devices, Photosensitivity), Light, Resistance (Electrical), Capacitance, Metals, Oxides, Silicon oxides, Silicon, Surface properties, Resistors

A modified Schering bridge circuit was used to measure the resistance and capacitance of a metal-oxidesemiconductor capacitor (MOSC) illuminated by a 500 watt tungsten-filament lamp. An increase in capacitance ranged from 55% at .6 mc to 4% at 40 mc with light, and the quality factor ranged from a peak of 65 at 12 mc with no light to a peak of 6.5 at 30 mc with light. For small frequency variations around the peak values of Q the MOSC had constant characteristics and could be used as a light tunable capacitor in a parallel L-C circuit. (Author)

AD-623 107 Div. 8/2 ,26/3
CFSTI Prices: HC $1.00 MF $0.50
SPRAGUE ELECTRIC CO NORTH ADAMS MASS
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS.
Quarterly rept. no. 8, 29 Mar-29 Jun 65,
by J. M. Eckfeldt, and J. H. D. Folster. 29 Jun 65, 11p. Contract DA36 039AMC03621E

Unclassified report

See also AD-618 719.

Descriptors: (*Tantalum capacitors, Manufacturing methods), Production, Procession, Life expectancy, Reliability (Electronics)

The production run of 9150 capacitors of nine different ratings for the 10,000-hr extended life test was continued. Processing of these lots is now approximately 95% complete. The screening prescribed by Specification MIL-C-39003 is more than 50% complete.

AD-623 138 Div. 8/2 ,8/3 ,25/6 ,17/6
CFSTI Prices: HC $2.00 MF $0.50
RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS
MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.
Interim development rept. no. 1, 8 Jun-1 Sep 65. 1 Sep 65, 29p. Contract NObsr93320 Proj. SR008 0303 Task 9371

Unclassified report

Descriptors: (*Microminiaturization (Electronics), Display systems), (*Printed circuits, Intermetallic compounds), (*Cadmium alloys, Silenium alloys), (*Intermetallic compounds, Printed circuits), Solid state physics, Molecular electronics, Sandwich construction, Semiconductors, Hysteresis, Electrical conductance, Test equipment (Electronics), Electroluminescence, Manufacturing methods, Costs, Feasibility studies, Subminiature electronic equipment

The work performed during this reporting period and described herein involved for the most part preparation for the configuration and fabrication studies that will be performed during the next two quarters. The essential features of the program plan, mask fabrication, CdSe preparation, and the testing circuitry are described. Tests made to determine the flatness of TIC etched glass and the variation of gap separation in the sandwich structure are also reported. The purpose of this program is to perform exploratory development of a Microelectronic Solid-State Display Assembly based on the molecular property of hysteresis in the electrical conductivity of cadmium selenide (CdSe). This hysteresis property can be used as a switch to control an electroluminescent (EL) element, and a major effort of the program is to demonstrate the feasibility of mass producing the CdSe-EL combination for use in low-cost displays. (Author)

AD-623 197 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ARMOUR RESEARCH FOUNDATION CHICAGO ILL
EVALUATION OF SILICON METALLIC RECTIFIERS.
Interim engineering rept. no. 12, 1 Apr-30 Jun 61, by B. F. Lathan. 1 Jul 61, 23p. Contract NObs72444 Proj. SF013 12 09 ,ARF E107

Unclassified report

See also AD-276 987

Descriptors: (*Silicon, Crystal rectifiers), (*Crystal rectifiers, Silicon), Life expectancy, Diodes (Semiconductor), Performance (Engineering), Temperature

Three groups of type 1N540 rectifiers are being subjected to life test at different ambient temperatures to determine three points on a curve of life versus ambient temperature. An accumulated test time of 10,000 hours has been represented by data gathered on the 200C environmental group. The life experiment on this group was terminated after the 10,000-hour measurement. A total of 35 failures have occurred, and 10 diodes have survived the test on this group. The 185€ and 170C environmental groups have been subjected to over 7000 hours of experiment. At the end of 6912 hours, 32 failures had occurred for the 185C test

group and seven failures for the 170C test group. Diodes from Manufacturer '6' have continued to exhibit superior performance at the elevated temperatures of 200C and 185C. (Author)

AD-623 265 Div. 8/2 ,26/3
CFSTI Prices: HC $3.00 MF $0.75
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
PRODUCTION ENGINEERING MEASURE FOR A GERMANIUM PNP POWER TRANSISTOR.
Quarterly progress rept. no. 1, 14 Apr-14 Jul 65,
by Dan Sullivan, and Paul Greer. 14 Jul 65. 82p.
Contract DA36 039AMC06161E
Unclassified report

Descriptors: (*Transistors, Germanium), (*Germanium, Transistors), Manufacturing methods, Processing, Electrical properties, Reliability (Electronics), Quality control

This describes the electrical requirements that the germanium power transistor must meet to operate effectively in the desired application. A brief discussion of the important electrical parameters and how they can be optimized is given. The fabrication process for this germanium transistor is also presented. Engineering investigations designed to improve the reliability, the yields, and parameter distributions of this device are discussed and their results reported. (Author)

AD-623 284 Div. 8/2 ,26/1
CFSTI Prices: HC $3.00 MF $0.75
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
MICROBONDS FOR HYBRID MICROCIRCUITS.
Quarterly rept. no. 4, 1 Nov 64-31 Jan 65,
by R. J. Green, and S. L. Rogers. 31 Jan 65, 89p.
Rept. no. HSER-3111
Contract DA36 039AMC03742E Proj. DA1P6 22001A057
Unclassified report

Descriptors: (*Bonding, Microminiaturization (Electronics)), (*Electric connectors, Bonding), (*Microminiaturization (Electronics), Circuits), Circuit interconnections, Gold, Electric wire, Metal films, Chromium, Nickel, Statistical analysis, Aluminum, Aging (Materials), Welding, Bonded joints, Mechanical properties

A statistical analysis of the reproducibility of microbonds between gold wire and Au/Cr films on a variety of substrates are presented. These bonding material combinations have been demonstrated to produce high strength with conductors of 0.0007, 0.002 and 0.005 inch diameter gold wires where the total film thickness exceeds 15,000 A. The effects of substrate materials have been shown to be secondary unless the substrate material is sensitive to thermal shock. Microbonds between gold wire and aluminum films on alumina, glass, silicon or exidised silicon substrates are not compatible with split tip welding. Details of test and evaluation programs on these microbonds are presented. Thermal aging studies on a variety of microbonds are discussed. Thermal aging of the gold to gold systems showed insignificant changes in bond resistance until diffusion and/or oxidation at the higher temperatures prevented further test readings. Bonds between gold and aluminum films deteriorated rapidly at aging temperatures as low as 125C. The factual data also includes a discussion of the effects of thermal shock on a number of microbonds. (Author)

AD-623 288 Div. 8/2 ,8/1
FRANK J SEILER RESEARCH LAB AIR FORCE ACADEMY COLO
AN EXPERIMENTAL INVESTIGATION OF A TWOSLOT TRANSMISSION LINE ON NONPLANAR SURFACES.
Revised ed.,
by Robert W. Burton, and R. W. P. King. 14 Jan 65, 7p. Rept. no. SRL-65-2
Contract Nonr186632
Unclassified report

Pub. in IEEE Transactions on Microwave Theory and Techniques vMTT13 n3 p303-6 May 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 5 Nov 64. Prepared in cooperation with Gordon McKay Lab., Harvard Univ., Cambridge, Mass.

Descriptors: (*Transmission lines, Slot antennas), Microwave frequency, Waveguide bends, Waveguide slots

The two-slot transmission line, which is the dual of a two-strip line when both lines lie in a plane, is studied experimentally when the metal sheet into which it is cut is bent through angles up to 90 deg. It is found that the bent two-slot line is substantially the dual of a similarly bent two-strip line including a complementary reactive junction network at the bend. (Author)

AD-623 302 Div. 8/4 ,25/3 ,8/1
CFSTI Prices: HC $1.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
MERCURY ARC PLASMA TUBE,
by John A. Rosado. 31 Aug 65, 20p. Rept. no. TM-65-43
Proj. HDL23800
Unclassified report

Descriptors: (*Discharge tubes, Plasma medium), (*Electric arcs, Mercury), (*Plasma sheath, Microwave equipment), Electron tubes, Antennas, Coupled antennas, Low-pressure research

A general description of a cylindrical, low-pressure mercury arc plasma tube, 51 cm high and 60 cm across, is given. The tube is operated at 15 v dc and may be continuously evacuated by a 6-in mercury diffusion pump. Controlled electron densities of 10 to the 17th power to 10 to the 19th power/cu.m. are achieved by adjusting the current from 50 to 2500 amp. The tube was designed for studying interactions between plasma and immersed microwave antenna array systems, and for other studies in which a relatively extensive plasma is desirable. (Author)

AD-623 314 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
ELECTRONIC FILMS INC BURLINGTON MASS
LOW - COST MICROCIRCUIT NETWORKS.
Quarterly progress rept. no. 3, 1 Apr-31 Jul 65,
by W. MacDonald. 31 Jul 65, 28p. Contract DA28 043AMC00284E Proj. DA1P6 22001A057 Task DA1P6 22001A057 03
Unclassified report

Descriptors: (*Resistors, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Circuits), Processing, Metal films, Chromium, Resistance (Electrical), Capacitors, Ceramic materials, Disks, Costs, Life expectancy, Vapor plating, Vacuum apparatus, Copper, Gold

Thin film resistor networks can be produced in the 0.310 x 0.310 wafer size at a per resistor cost ranging between 3.5 and 3.8 cents per resistor. This is best accomplished by cutting the 0.310 wafer out of a larger wafer (1 x 1 inch or larger) after the wafer has been processed through h etching step. This procedure cuts down the wafer handling cost and permits the production of the low cost resistor. The load life stability of the chromium film resistor is very good. An 0.38% average change in resistor value was obtained after 500 hours exposure to 1/4 watt at 125C. The copper conductor degrades this performance by oxidizing. A gold conductor was used to obtain the high stability figure. (Author)

AD-623 320 Div. 8/2 ,26/3
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO LYNCHBURG VA COMMUNICATION PRODUCTS DEPT
MICROMINIATURE CRYSTAL UNIT TYPE CR-(XM-47) /U PRODUCTION ENGINEERING MEASURE.
Quarterly progress rept. no. 1, 26 May-26 Aug 65,
by R. L. Hatcher. 21 Sep 65, 37p. Contract DA36 039AMC06166E
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Crystals, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Crystals), Manufacturing methods, Reliability (Electronics), High frequency

Progress is reported to establish production techniques and demonstrate the capability of a pilot facility to manufacture reliable Microminiature Crystal Units Type CR (XM-47) /U at a specified rate of 20 units per 8 hour shift. (Author)

AD-623 324 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
GENERAL TELEPHONE AND ELECTRONICS LABS INC BAYSIDE N Y
SEMICONDUCTOR MICROWAVE AMPLITUDE AND PHASE MODULATOR.
Quarterly rept. no. 9, 16 May-15 Aug 65,
by R. Harrison, J. Zucker, F. Drago, D. Fleri, and R. Socci. 14 Sep 65, 20p. Rept. no. TR-65-103.9
Contract DA36 039AMC02284E Proj. 1P6 22001A056
Unclassified report

See also AD-619 579.

Descriptors: (*Modulators, Semiconductor devices), (*Semiconductor devices, Modulators), Microwave equipment, Phase modulation, Amplitude modulation, Radiofrequency power, Varactor diodes, Dielectric films, Epoxy plastics, Encapsulation, Polyester plastics, Epitaxial growth, Aluminum, Single crystals, Impurities, Gallium, Phase shift, Standing wave ratios

The drive power required to maintain a constant modulation index as the rf carrier power was varied from 0.22 mW to 2.5 mW was experimentally determined for the PIN amplitude modulator. A linear relation was found to exist between the modulation drive and the rf carrier power levels. Effort to stabilize the varactors for the phase modulator by coating the semiconductor surface with a thin dielectric film was continued. Ciba Araldite 6005 epoxy has been found to be effective in enhancing varactor stability. Experiments to encapsulate the varactor in an inert atmosphere with mylar windows or dielectric plugs were initiated. Theoretical analysis indicates that the voltage-dependent resistance of a properly biased PIN diode can be used to achieve phase modulation consistent with the program requirements. (Author)

AD-623 359 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
FACTORS AFFECTING TRANSISTOR FAILURE IN DC TO DC CONVERTERS.
Technical rept.,
by Bernard Reich. Jul 65, 16p. Rept. no. ECOM-2620
Proj. DA 1P6 22001A056 Task 1P6 22001A 056 01
Unclassified report

Descriptors: (*Transistors, Reliability (Electronics)), Voltage, Performance (Engineering), Circuits, Oscillators

The purpose of this report is to indicate assignable

causes of failure of transistors in dc to dc converters. While seemingly power transistor converter failures occur with no apparent cause after many cycles of operation, an examination of the load characteristics can reveal a potential failure pattern. The load line characteristic coupled with the safe area limits of the transistor has revealed potential failure patterns in converters described in this report. This analysis has lead to a much better understanding of transistor failures observed with the types of converters analyzed. (Author)

AD-623 395 Div. 8/2 ,26/3
CFSTI Prices: HC $3.00 MF $0.75
CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO NORWOOD MASS
PRODUCTION ENGINEERING MEASURE FOR THE PRODUCTION OF SILICON MONOXIDE CAPACITORS MICROELEMENT.
Quarterly rept. no. 9, 1 Jun-31 Aug 65,
by J. J. O'Connor. 31 Aug 65, 73p. Contract DA36 039AMC01478E
Unclassified report

See also AD-619 880.

Descriptors: (*Capacitors, Manufacturing methods), (*Silicon compounds, Ceramic capacitors), Monoxides, Microminiaturization (Electronics), Life expectancy, Disks, Modules (Electronics), Performance (Engineering), Electric insulation, Capacitance

Tests were made of all microelements and simulated modules after 2000-hours at 100 volts and 125C has been completed. The test data is presented.

AD-623 403 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
TRANSISTOR, FIELD EFFECT, INSULATOR GATE, 100-MC AMPLIFIER.
Quarterly progress rept. no. 4, 1 Apr-30 Jun 65,
by R. Dawson, and M. Mitchell. 30 Jun 65, 29p.
Contract DA28 043AMC00314E Proj. DA1P6 22001A05601
Unclassified report

Descriptors: (*Transistor amplifiers, Very high frequency), Oxides, Metals, Radiofrequency power, Gain, Noise (Radio), Modulation, Performance (Engineering), Transistors, Feedback

The present devices have power gains of 18 to 24db at 100mc operating at VsubD = 6 volts and IsubD =2 ma. Noise figures average about 2.5db. Average gate breakdowns are 85 volts; while the source-drain breakdowns average 20 volts. AGC and cross modulation characteristics are excellent. Noise measurements confirm the theory as predicted by Jordan and Jordan and exhibit a low pass roll off which occurs in the 10 to 100Mc region.

AD-623 417 Div. 8/2 ,6/6
CFSTI Prices: HC $2.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS APARATUS DIV
DEVELOPMENT OF KU-BAND DUAL-CHANNEL PARAMETRIC AMPLIFIER.
Rept. no. 1 (Final) 15 Dec 64-15 Jun 65,
by W. E. Wells,Jr., and J. C. Sadler. 15 Jun 65, 39p. Rept. no. U1-60990-1
Contract DA28 043AMC00439E Proj. DA1P6 22001 A056
Unclassified report

Descriptors: (*Parametric amplifiers, Radar equipment), (*K-band, Parametric amplifiers), Bandwidth, Gain, Noise (Radar), Varactor diodes, Microwave amplifiers

The modification is described of an existing Ksub uband nondegenerate parametric amplifier and construction of a dual-channel system, complete with power supply. The final product displayed 40-mc bandwidth and 20-db gain at 16.5 Gc =50 mc. The two channels had noise figures less than 2.7 db and 3.2 db respectively. An evaluation of several types of varactors led to the selection of a Schottky barrier varactor as the active element. Extending the Schottky barrier technique to parametric amplifier varactors has yielded a new means of obtaining very low noise microwave amplification and high pump efficiency. A breadboard amplifier was operated with a noise figure of 2.2 db (less circulator) and required 10 mw of pump power at 40 Gc. It had a bandwidth of 65 mc at 20-db gain and was electronically tunable over 900 mc. (Author)

AD-623 419 Div. 8/4 ,8/3
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
PARTIAL CONVERSION OF CURRENT MODULATION IN LINEAR-PHOTOELECTRON-BEAM SYSTEMS.
Revised ed.,
by I. Sakuraba, and J. E. Rowe. 9 Mar 65, 6p.
Contract DA ARO D31 124G634
AROD , 5427:2
Unclassified report

Pub. in IEEE Transactions on Electron Devices, vED12 n6 p388-9 Jun 1965. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 16 Nov 64.

Descriptors: (*Photoelectrons, Particle beams), (*Electron beams, Modulation), Electron guns, Traveling-wave tubes, Circuits

It is shown that the equivalent resistance, including initial velocity as well as current modulation, of linear-photoelectron-beam systems can be expressed in a different form by defining two modulation parameters. It is found that, under some operating conditions, the equivalent resistance decreases with increasing average photoelectron current because of partial conversion effects (velocity modulation to current modulation and vice versa), producing a dip analogous to the QC dip.

AD-623 470 Div. 8/4 ,7/5
CFSTI Prices: HC $2.00 MF $0.50
MARTIN CO ORLANDO FLA
QUANTUM MULTIPLIERS AND MIXERS.
Quarterly progress rept. no. 1, 1 May-31 Jul 65,
by V. E. Derr, G. W. Bechtold, and R. A. Kempf. Oct 65, 53p. Rept. no. or-6686
Contract DA28 043AMC01320E Proj. 1P6 2200sA058
Unclassified report

Descriptors: (*Electron multipliers, Pumping (Electronics)), (*Mixers (Electronic), Pumping (Electronics)), Quantum mechanics, Electron transitions, Masers, Generators, Millimeter waves, Oscillators, Frequency converters, Interferometers

The theoretical basis for harmonic generation due to nonlinear quantum susceptibilities in gases is reviewed. Examples of partly resonant and resonant systems are given. The initial experimentation on the apparatus for a two-level, third harmonic, partly resonant system is discussed. Preparation for construction of apparatus for the resonant frequency scheme are described. Absorption studies of multiple quantum effects in MgO (Mn2+) are discussed. (Author)

AD-623 505 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
SYRACUSE UNIV N Y DEPT OF ELECTRICAL ENGINEERING
N-TH ORDER, QUASI-HARMONIC OSCILLATORS,
by Theodore A. Bickart, and Stephen G. Dick. Oct 65, 39p. Rept. no. TM-65-2
Contract AF30 602 3538 Proj. 8505 Task 850501
RADC , TR-65-275
Unclassified report

Descriptors: (*Harmonic oscillators, Circuits), (*Circuits, Harmonic analysis), Differential equations, Feedback, Linear systems

The report contains an expository treatment of oscillators systems which can be modeled as an Nth order nearly linear system, the linear portion of which can be described by a conjugate pair of roots. The results are consistent with those of Loeb's paper (in French) of 1956. The contribution is in the establishment of the main results by way of an alternative development. (Author)

AD-623 507 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
HF AND VHF QUARTZ-FILTER-CRYSTAL DESIGN CONSIDERATIONS.
Techodore J. Lukaszek. Jul 65, 36p. Rept. no. ECOM-2615
Proj. DA1P6 22001A058 Task DA1P6 22001A058 01,DA1P6 22001A058 01 14
Unclassified report

Descriptors: (*Crystal filters, Quartz), High frequency, Very high frequency, Crystal, Thickness, Narrowband, Electrical properties, Quartz resonators

Studies into the problems associated with the design of quartz filter crystals in the HF and VHF range have resulted in design data for producing crystal units with a wide range of equivalent circuit parameters while still maintaining a suppression of unwanted modes to approximately 40 db. To plate thickness ration together with the total mass deposition. In essence, to obtain a wide range of the equivalent electric circuit parameters, it is necessary to vary the electrode size. An adequate suppression of unwanted modes is assured by a proper selection of mass loading. The proper choice of mass loading one must use has been investigated extensively at this Command in an effort to determine, first, the optimum plating thickness which will give the required mass loading for maximum suppression of unwanted modes, and seconcly, to determine the range of electrode thicknesses that can be used on either side of this optimum, and still maintain a 40 db suppression, i.e., amplitude of unwanted modes vs. plate back information. Having this, a criterion can be established on the tolerance of the unplated wafer frequency. Design information resulting from these investigations with filter crystals operating on the fundamental and fifth overtone is presented.

AD-623 510 Div. 8/2 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
DEVELOPMENT OF INTEGRATED CIRCUITS UTILIZING COMPLEMENTARY TRANSISTORS.
Interim development rept. no. 1, 1 Jul-30 Sep 65. 30 Sep 65, 38p. Contract NObsr93365 Proj. SR008 0303 Task 9631
Unclassified report

Descriptors: (*Integrated circuits, Transistors), (*Transistors, Integrated circuits), Impurities, Oxides, Silanes, Epitaxial growth, Etched crystals, Semiconducting films

Complementary pnp-npn bipolar integrated circuits can be fabricated by diffusing from a doped oxide source that is deposited on the silicon surface. This technique, wherein the doped oxide is deposited at a low temperature by the thermal oxidation of SiH4, makes possible the simultaneous diffusion of oppositely doped impurities, so that 'mirror image' pnp-npn characteristics can be achieved. Substrate preparation, to maintain isolation between devices while providing proper collector

regions for each, can be achieved by combining RCA's 'handle' oxide isolation technique with pocket etch and epitaxial refill techniques. Transistor masks were designed and fabricated, preliminary calibration of the doped oxide systems were established for the required n and p concentrations, standard work stations for silane deposition systems were designed and ordered and single devices were fabricated using doped oxide diffusions. (Author)

AD-623 584 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
CENTRE DE PHYSIQUE ELECTRONIQUE ET CORPUSCULAIRE ORSAY (FRANCE)
HALF MILLIMETER 'BACKWARD WAVE' OSCILLATOR.
Technical progress rept. no. 2, 1 Apr-30 Jun 65. Jul 65, 27p. Rept. no. WR-1421
Contract AF61 052 814

Unclassified report

See also AD-464 316.

Descriptors: (*Backward-wave oscillators, Millimeter waves), Electron guns, Focusing, Magnetic fields, Electromagnetic shielding, Electromagnets, Performance (Engineering)

Progress is reported on the electron gun study including magnetic shield studies, electrolytic tank measurements, gun hot tests, and cold tests of the slow-wave structure for a O - type Carcinotron with a center frequency of 600 KMc/s.

AD-623 585 Div. 8/2
CFSTI Prices: HC $4.00 MF $1.00
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
ANALYSIS AND DESIGN CONSIDERATIONS FOR DISTRIBUTED RC NETWORKS WITH ARBITRARY TAPER.
Scientific rept.,
by John J. Kelly. Aug 65, 145p. Rept. no. TR-400-115 ,SR-18
Contract AF19 628 379 Proj. 5628 Task 562806
AFCRL , 65-577

Unclassified report

Descriptors: (*Electrical networks, Semiconductor devices), Microminiaturization (Electronics), Resistance (Electrical), Capacitance, Taper, Transistors, Feedback, Circuit interconnections, Complex variables

Analysis and design techniques are considered for arbitrarily tapered distributed RC networks. The RC two-port parameters are shown to be simple functions of the Basic Set solutions of the Sturm Equation. The immittance parameters, when written in Basic Set notation, are treated in the context of classical lumped network theory. They are shown to be positive real functions and their polezero characteristics in the s-plane are shown to be closely related to those of lumped RC networks. From the knowledge of the network poles and zeros, root locus is shown to be an efficient method of determining network behavior. The design of RC networks to realize a low-pass and bandpass network function is considered. The low-pass design is accomplished by including a specification of allowable magnitude and phase error in the statement of the desired low-pass function. The RC network is chosen so that the error terms are within the specified bounds. Bandpass response is accomplished using an active element and feedback. Extensive use is made of the root locus to achieve a design which is relatively insensitive to network parameter variations.

AD-623 586 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
A NEW CLASS OF FILTERS FOR PULSE APPLICATIONS.
Scientific rept.,
by Mohammed S. Ghausi, and Michael Adamowicz. Sep 65, 44p. Rept. no. TR-400-117 ,SR-20
Contract AF19 628 379 Grant ,NSF GE6272
Proj. 5628 Task 562806
AFCRL , 65-718

Unclassified report

Descriptors: (*Low-pass filters, Electromagnetic pulses), Networks, Transients, Pulse amplifiers, Frequency, Time, Functions, Polynomials

The steady-state and transient response characteristics of a new class of low-pass filters are investigated. The natural frequencies of the proposed filters all lie on catenary contours and the transmission zeros are all at infinity. This class of filters has some favorable transmission properties when both time and frequency domain considerations are important. The response characteristics of this class of filters are compared with those of Butterworth, Thomson and the recent one due to Mullick. It is shown that this class has some advantages when rise-time, overshoot, and 3db frequency of the magnitude response (with no frequency peaking) are all of importance. (Author)

AD-623 593 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
THEORETICAL INVESTIGATION OF A NON-PLANAR FIELD-EFFECT TRANSISTOR,
by S. R. Levine. 7 Jul 65, 66p. Rept. no. ERL-M-122
Contract DA31 124ARO D385 Grant ,AF AFOSR139 65 Proj. DA5537M
AROD , 5537:2

Unclassified report

Descriptors: (*Transistors, Mathematical analysis), Configuration, Volume, Graphics, Electric currents, Voltage, Space charges, Capacitance

The report applies the generalized analysis of planar field-effect transistors developed by Richer to the calculation of theoretical performance in a volume field-effect transistor. Richer's analysis is illustrated first, then the mathematical techniques are extended to cover the case of an arbitrarily-shaped volume FET. This extended general analysis is then applied to a FET with circular cylindricalgeometry. Graphs of computer solutions of FET draincurrent, drain-voltage characteristics, and of equivalentcircuit element values are presented. The characteristics of the planar and cylindrical FET's are compared. (Author)

AD-623 604 Div. 8/2
LINCOLN LAB MASS INST OF TECH LEXINGTON
AN INTERMEDIATE VALUE THEOREM FOR SEQUENTIAL ANALOG TO DIGITAL CONVERTERS WITHOUT SAMPLE-HOLD,
by William L. Black. 27 Oct 64, 3p.

Unclassified report

Pub. in Information and Control v8 n4 p451-3 Aug 1965 (Copies not available to DDC or Clearinghouse customers). Research supported by U. S. Air Force.

Descriptors: (*Analog-to-digital converters, Theorems), (*Theorems, Analog-to-digital converters)

AD-623 609 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
WATKINS-JOHNSON CO PALO ALTO CALIF
DEVELOPMENT AND DELIVERY OF A VERY LOW-NOISE TRAVELING-WAVE TUBE AMPLIFIER.
Rept. no. 6 (Final), 1 Jul 63-1 Apr 65,
by John N. Nelson. 1 Apr 65, 89p. Contract DA36 039AMC03253E Task DA1G6 22001A055 04

Unclassified report

Descriptors: (*Microwave amplifiers, Traveling-wave tubes), (*Traveling-wave tubes, Microwave amplifiers), X band, Noise (Radio), Magnet, Focusing, Electron guns, Weight, Magnet fields, Cathodes (Electron tubes)

The report describes the design and development of the WJ-276-6, a 5 dB terminal noise figure, 8.0 to 12.0 Gc/s, permanent magnet focused traveling-wave tube amplifier with integral power supply. The major problem in the development was reducing the terminal noise figure to less than 5 dB, while keeping the weight of the amplifier to less than 15 pounds. This problem was solved by the use of a hybrid straight field magnet, which provided a peak magnetic field of 1500 gauss in the critical region of the cathode and electron gun; a high gamma a, low RF loss helix assembly; a novel thin-rim cathode and flexible low noise gun assembly; and low RF loss waveguide input coupling. The report describes the important design considerations and the effect of the design parameters on traveling-wave tube performance. A physical description of the tube is presented along with important fabrication and measurement techniques. The progress which lead to the final design is chronicled, and the initial and final design values compared. (Author)

AD-623 636 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
EDGERTON GERMESHAUSEN AND GRIER INC BEDFORD MASS SYSTEMS DIV
DESIGN MODIFICATION AND CONSTRUCTION OF HIGH POWER DEUTERIUM THYRATRONS.
Quarterly technical rept. no. 2, 15 Jul-15 Oct 65, by Nicholas Reinhardt. 12 Nov 65, 6p. Rept. no. B-3193
Contract NObsr89405 Proj. SR0080301 Task 9434

Unclassified report

Descriptors: (*Thyratrons, Design), (*Cathodes (Electron tube), Stability), Deuterium, Electron tube parts, Construction, Gas discharges, Performance (Engineering)

A second phase of development of the high-power deuterium thyratron was entered into (for first phase see AD-610 548). Emphasis was on incorporating improvements which will insure long term stability of various cathode parameters. A revised cathode structure was designed and fabricated using short lead time techniques. Details of this design and preliminary evaluation of the performance of the tube in which it was incorporated are given.

AD-623 099 See Fld. 14/2

AD-623 195 See Fld. 15/5

AD-623 196 See Fld. 15/5

AD-623 224 See Fld. 20/3

AD-623 404 See Fld. 20/3

AD-623 500 See Fld. 9/2

AD-623 509 See Fld. 20

AD-623 546 See Fld. 20/10

AD-623 555 See Fld. 9/2

AD-623 597 See Fld. 14/2

AD-623 640 See Fld. 18/8

AD-623 651 See Fld. 5/1

9/2. COMPUTERS

AD-623 205 Div. 30/2 ,28/4
CFSTI Prices: HC $3.00 MF $0.50
PRINCETON UNIV N J
SOME IBM 7090-94 PROGRAMS FOR NONLINEAR FACTOR ANALYSIS,
by Roderick P. McDonald. Aug 65, 56p. Rept. no. RM-65-11
Contract Nonr185815 Grant ,NSF G22889 Proj. NR150 088

Unclassified report

Prepared in cooperation with Educational Testing Service, Princeton, N. J.

Descriptors: (*Programming (Computers), Factor analysis), (*Factor analysis, Programming (Computers)), Punched cards, Iterative methods, Psychometrics

The programs described were written for use within the content of a theory of nonlinear factor analysis developed by McDonald. In this context, three of the programs, SPAN, POSER, and FAINT, expect as input the results of a series of standard factor analysis operations. In particular, the input formats are chosen to conform to the PUNCH format from PSTAT. The fourth program, COPE, expects as input the punched output from either SPAN or POSER, and some punched output as available from PSTAT. In their present form, then, the programs communicate with each other via punched cards. With suitable modifications this could be done via tape.

AD-623 207 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTRONIC MODEL OF SELF-ADAPTIVE AND SELF-TEACHING SYSTEMS,
by O. A. Charkviani, and D. K. Surguladze. 22 Sep 65, 55p. Rept. no. FTD-TT-65-140
TT , 65-64425

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Grusinskoi SSR, Tiflis. Institut Elektroniki, Avtomatiki i Telemekhaniki. Trudy, v3 p3-33 1962. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Bionics, Learning), (*Computer logic, Bionics), Models (Simulations), Analog computers, Automata, Data storage systems, Integrators, Amplifiers, Inverters, Ferrites, USSR

A detailed description is given of a recent version of an analog computer for simulation of self-adaptive and self-teaching systems.

AD-623 209 Div. 30/2 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
NEW DEVICE FOR SOLVING INTEGRAL EQUATIONS,
by A. F. Verlan. 7 Oct 65, 8p. Rept. no. FTD-TT-65-1023
TT , 65-64427

Unclassified report

Unedited rough draft trans. of Avtomatika i Priborostroenie (USSR) v3 n3 p24-5 1964.

Descriptors: (*Integral equations, Numerical analysis), (*Analog computers, Integral equations), Integral transforms, Functional analysis, Design, Operation, USSR

AD-623 215 Div. 30/2
CFSTI Prices: HC $4.00 MF $1.00
SYSTEMS RESEARCH CENTER CASE INST OF TECH CLEVELAND OHIO
ADAPTIVE PATTERN RECOGNITION USING NON-LINEAR ELEMENTS.
Master's thesis,
by Anthony N. Mucciardi. Oct 64, 132p. Rept. no. SRC-65-A-64-22
Contract AF AFOSR125 64 ,AF AFOSR751 65

Unclassified report

Descriptors: (*Pattern recognition, Input-output devices), Nonlinear systems, Automatic, Simulation, Computer logic, Artificial intelligence, Optimization

A pattern recognition device which computes a weighted sum of all products of its binary input variables is investigated. It is proven that this device can uniquely synthesize any real function of its inputs. The size of this device becomes prohibitive as the number of inputs increases and the concept of an incomplete device is introduced and discussed. A convergence proof of an adaptive training procedure for real outputs, based on the equivalence between this device and a multi-threshold linear device in a larger input space, is presented. A set of orthogonal property detectors is defined and shown to be numerically equal to the number of binary inputs. A computer simulation of a 64-input incomplete device shows that its generalizing abilities are more fully utilized with the aid of specific property detectors. A self-organizing technique consisting of periodically discarding low-weighted terms and replacing them with randomly chosen terms is discussed. Experiments conducted using this technique demonstrate that the learning and generalizing performances of the incomplete device are greatly improved if the device is free to change its structure according to a heuristic policy. (Author)

AD-623 261 Div. 30/2 ,30/3 ,8/3
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE
GRAPHICAL PROCESSING USING HYBRID ANALOGDIGITAL CIRCUITRY,
by David P. Casasent. 30 Aug 65, 80p. Rept. no. 187
Contract Nonr183415

Unclassified report

Descriptors: (*Analog-digital computers, Transformations (Mathematics)), (*Graphics, Display systems), (*Display systems, Graphics), Computer logic, Topology, Data processing systems

By assigning analog voltages to the coordinates of a graph, drawings can be electrically displayed. By means of a sine-cosine potentiometer, resistance chains, and diamond gates with appropriate gate signals from digital counters, these drawings can be transformed (i.e., translated, rotated, magnified). Resistive summing networks and compensated current amplifiers provide the translation, while an ultralinear voltage amplifier achieves the magnification. This ultralinear voltage amplifier consists essentially of two two-stage amplifiers feeding a constant-current pre-output stage with negative feedback applied to the first stages. Thermal and nonthermal parameter variations are compensated for by a linearization of the used portions of the power dissipation and V sub eb versus i sub c curves, the constantcurrent output stage, and circuit compensating transistor pairs. This topology produces an amplifier with a gain constant within 0.33 per cent, a 20 volt output range, a drift and offset voltage of less than 9 mv, and a frequency response of d-c to 1 mc with a square wave input. It can supply 10 ma at all voltage levels with an error of less than 16 mv. Component replacement is possible with no loss of accuracy. (Author)

AD-623 280 Div. 30/2
CFSTI Prices: HC $2.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
GRAPHICAL-DATA-PROCESSING RESEARCH STUDY AND EXPERIMENTAL INVESTIGATION.
Quarterly progress rept. no. 8, 1 May-31 Jul 65,
by A. E. Brain, R. O. Duda, and J. H. Munson. Aug 65, 42p. Contract DA36 039AMC03247E Proj. DA1P020401A327 02 01,SRI4565

Unclassified report

Continuation of Contract DA36 039sc78343, R-20. See also AD-618 567.

Descriptors: (*Graphics, Data processing systems), (*Information retrieval, Graphics), (*Pattern recognition, Graphics), (*Data processing systems, Military requirements), Digital computers, Special functions (Mathematical), Computer logic, Computers, Tests

A method for making a mask-plate for the 1024-image preprocessor is described in detail. The masks are organized in pairs and with the appropriate circuitry function as edge-detectors. Recognition experiments on hand-drawn map symbols parallel to those previously reported for the 100-image preprocessor have been carried out using the 1024-image preprocessor. In order to extend the work on mask design by simulation, it is desired to input a low-resolution TV picture into the SDS 910 computer. The standards chosen are 24-line and 120-line. Seven methods for interfacing the TV camera output with the SDS 910 have been examined. The shift-register method has been selected for implementation. (Author)

AD-623 487 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y INFORMATION PROCESSING BRANCH
AN APPROACH TO AUTOMATED CONTEXTUAL CHARACTER RECOGNITION,
by Charles A. Constantino, John C. Faust, and John W. Sammon,Jr.. Sep 65, 23p. Rept. no. RADC-TR-65-350
Proj. 5581 Task 558104

Unclassified report

Descriptors: (*Character recognition, Automatic), Reading machines, Classification, Pattern recognition, Transformations (Mathematics), Decision theory, Probability

The purpose of this report is to combine current knowledge and technology to set forth an approach for designing a machine capable of recognizing various styles of typed characters. This approach differs considerably from existing approaches in that it has the capability to make use of context to aid in recognition. This is accomplished by the tabulation of the probability that one particular letter follows another letter. Hence, when attempting to recognize a typed character, the machine has knowledge of the previous letters or letter that it recognized, and can make use of this information in identifying the typed character presently being processed. (Author)

AD-623 500 Div. 30/2 ,8/2
CASE INST OF TECH CLEVELAND OHIO ENGINEERING DIV
A SYNTHESIS TECHNIQUE FOR NETWORKS CONSISTING OF LOGICAL FUNCTIONS FEEDING A LINEAR SUMMATION ELEMENT.
Revised ed.,
by Earl E. Gose. 1 Oct 64, 5p. Contract AF AFOSR751 65 ,AF AFOSR125 63 Proj. 9769 Task 976904
AFOSR , 65-1590

Unclassified report

Pub. in IEEE Transactions on Electronic Computers, vEC14 n2 p254-6 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Computer logic, Synthesis), Functions, Networks, Computers, Polynomials, Series, Matrix algebra

Two synthesis techniques for a class of networks for producing real functions of binary inputs are considered, one in which the functions are 'ands' and the other in which they are exclusive 'ors'. A synthesis technique is presented which is more general than the two proceding. It is valid for the realization of real, including Boolean, functions no matter what functions are used.

AD-623 555 Div. 30/2 ,8/2
CFSTI Prices: HC $3.00 MF $0.50
ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE
HYBRID CIRCUITS FOR THE PARAMATRIX SYSTEM,
by Edward F. Prozeller. 7 Sep 65, 51p. Rept. no. 188
Contract Nonr183415
Unclassified report

Descriptors: (*Analog-digital computers, Circuits), (*Circuits, Analog-digital computers), Special purpose computers, Computer logic, Pattern recognition, Gates (Circuits), Switching circuits, Gain, Voltage, Digital-to-analog converters

In order to design an analog/digital computer to perform pattern processing, it became necessary to design precision analog and analog/digital circuits. The design is discussed of two hybrid circuits, namely an analog comparator and an analog gate. The design of a compensated emitter-follower is also described as are the applications of these three circuits in the Paramatrix, pattern-processing computer. (Author)

AD-623 613 Div. 30/2
CFSTI Prices: HC $4.00 MF $0.75
LINK GROUP GENERAL PRECISION INC BINGHAMTON N Y
UNIVERSAL PRINT READER TECHNIQUES.
Final rept. for 30 Jun 63-May 65,
by R. B. Greenly, K. K. Maass, J. W. Meyer, and S. A. Michalik. Oct 65, 109p. Rept. no. 634
Contract AF30 602 3116 Proj. DW63 48
RADC , TDR-64-374 V1
Unclassified report

See also AD-623 614 and AD-623 621.

Descriptors: (*Character recognition, Standardization), (*Reading machines, Effectiveness), Optical equipment components, Typewriters, Vocabulary, Input-output devices, Optical scanning, Optical equipment, Computer logic

The objective of this program was to provide engineering services directed toward standardization of typewriter fonts and related features for optical scanning application. Primary emphasis was placed on investigation and evaluation of existing typewriter fonts and includes an evaluation of a type font developed by Subcommittee X3-1 on Character Recognition under American Standards Association Sectional Committee X3-1. Investigations were by computer programmed assessment of each font using a technique developed partly under Contract AF30 (602)-2642 sponsored by Rome Air Development Center (AD-404 846) and partly under continuing Link sponsored character recognition efforts. Evaluations were accomplished by extending the vocabulary capacity of a Link Multi-font Page Reader to permit machine reading of a significant volume of typewriter-prepared documents. Reject and error rates were determined in this manner for each of several type styles considered. (Author)

AD-623 614 Div. 30/2
CFSTI Prices: HC $7.00 MF $1.75
LINK GROUP GENERAL PRECISION INC BINGHAMTON N Y
UNIVERSAL PRINT READER TECHNIQUES.
Final rept.,
by R. B. Greenly, K. K. Maass, J. W. Meyer, and S. A. Michalik. Oct 65, 368p. Contract AF30 602 3116
RADC , TDR-64-374 V2
Unclassified report

See also AD-623 613 and AD-623 621.

Descriptors: (*Character recognition, Standardization), (*Reading machines, Effectiveness), Optical equipment components, Typewriters, Vocabulary, Inputoutput devices, Optical scanning, Optical equipment

Volume II presents the electronic masks of all characters in the Boldface no. 16, Artisan 10, Underwood Financial Gothic, Modified Manifold 12, and an American Standards Association Candidate font for optical character recognition. The significance of this data is that a convolution of any encoded character with the total form of any other character in the same vocabulary group will result in a minimum of five color differences (exceptions are noted) at the coded locations. Additionally, the stability of each encoded location has been proven by statistical research using actual type samples and electronic data processing aids. (Author)

AD-623 621 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
LINK GROUP GENERAL PRECISION INC BINGHAMTON N Y
UNIVERSAL PRINT READER TECHNIQUES.
Final rept.,
by R. B. Greenly, K. K. Maass, J. W. Meyer, and S. A. Michalik. Oct 65, 99p. Contract AF30 602 3116
RADC , TDR-64-374 V3
Unclassified report

See also AD-623 613 and AD-623 614.

Descriptors: (*Character recognition, Standardization), (*Reading machines, Effectiveness), Optical equipment components, Typewriters, Vocabulary, Inputoutput devices, Optical scanning, Optical equipment

The report of additional tasks includes one alphanumeric font and three numeric fonts which have been analyzed, stored in the memory of a Link Multifont Page Reader and reading performance determined using a significant volume of typewriter-prepared documents. The fonts evaluated are: (1) Farrington 12L2/12F2 (including Selfchek numerals), 36 characters; (2) Farrington Selfchek numerals, 10 characters; (3) Pica numerals, 10 characters; and (4) ASA TG1C numerals, 10 characters. It is the purpose of this investigation to evaluate and compare these fonts to determine the suitability of each for machine reading by optical scanning. (Author)

AD-623 090 See Fld. 19/5

AD-623 126 See Fld. 6/16

AD-623 140 See Fld. 17/2

AD-623 157 See Fld. 5/10

AD-623 162 See Fld. 5/2

AD-623 177 See Fld. 17/7

AD-623 233 See Fld. 15/5

AD-623 333 See Fld. 12/1

AD-623 334 See Fld. 4/2

AD-623 371 See Fld. 17/9

AD-623 391 See Fld. 20/6

AD-623 392 See Fld. 20/6

AD-623 404 See Fld. 20/3

AD-623 495 See Fld. 5/2

AD-623 526 See Fld. 5/9

AD-623 565 See Fld. 20/4

AD-623 590 See Fld. 5/2

AD-623 651 See Fld. 5/1

AD-623 661 See Fld. 8/2

9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

AD-623 145 Div. 8/3 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
THE CHARACTERIZATION AND IDENTIFICATION OF SYSTEMS.
Technical rept.,
by Charles R. Arnold, and Kumpati S. Narendra. 18 Jun 65, 88p. Rept. no. TR-471
Contract Nonr186616 Proj. NR371 012
Unclassified report

Descriptors: (*Mathematical models, Input-output devices), (*Input-output devices, Nonlinear systems), Model theory, Identification

This report provides a fairly exhaustive survey of deterministic models for the characterization of systems and of the techniques available for the subsequent identification of some physical system in terms of each of the various classes of models. The term 'system' refers, in general, to a nonlinear system and the major emphasis of the report is thus upon nonlinear models and their identification requirements. Most of the ideas presented in this report are not new. However, many of them are not widely known in the engineering field and it was thus felt desirable to collect, organize, and present them as clearly as possible for the engineer. (Author)

AD-623 176 Div. 7/3
CFSTI Prices: HC $1.00 MF $0.50
BURNDY CORP NORWALK CONN
PRODUCTION ENGINEERING OF TRIAXIAL PULSE CONNECTORS.
Quarterly rept. no. 10, 1 Apr-30 Jun 65,
by Mark L. Auriana. 30 Jun 65, 12p. Contract DA36 039sc85964
Unclassified report

See AD-615 323.

Descriptors: (*Electric connectors, Pulse cables), Design, Electrical corona, Performance (Engineering), Failure (Mechanics), Tests, Electric insulation

Five engineering samples (plugs and receptacles) for RG-156/U Cable were manufactured per SKM15357. Qualification testing of these 5 units

was begun. A mechanical aid, in the form of a positive, bi-directional mechanical stop should be incroporated in the design of the receptacle insert holding area. This would prevent loosening of the insert when the connectors are inadvertently mated with excessive force.

AD-623 192 Div. 8/3 ,6/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DETECTION AND JAMMING OF RADAR,
by Chang Lian. 20 Oct 65, 13p. Rept. no. FTD-TT-65-1100
TT , 65-64424
Unclassified report

Edited trans. of Wuxiandian Jishu (Chinese People's Republic) n6 p8-11, 21 1964.

Descriptors: (*Radar jamming, Radar signals), Radar equipment, Ranges (Distance), Frequency, China

Radar jamming region, frequency range, and techniques are discussed.

AD-623 138 See Fld. 9/1

AD-623 261 See Fld. 9/2

AD-623 303 See Fld. 17/7

AD-623 351 See Fld. 20/14

AD-623 419 See Fld. 9/1

AD-623 468 See Fld. 4/2

AD-623 475 See Fld. 7/4

AD-623 643 See Fld. 17/9

AD-623 645 See Fld. 17/2

AD-623 651 See Fld. 5/1

9/4. INFORMATION THEORY

AD-623 525 Div. 8/7
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
A DECODING METHOD FOR BOSE-CHAUDHURI BINARY CODES USING AN ERROR COUNTING TECHNIQUE,
by W. Jack Bouknight. Oct 65, 34p. Rept. no. R-267
Contract DA28 043AMC00073E Grant ,NSF GK36 Proj. 20014501B31F
Unclassified report

Descriptors: (*Decoding, Corrections), (*Coding, Errors), Communication theory, Counting methods

The implementation of a decoding scheme for BoseChaudhuri (n,K) cyclic codes is discussed. A method of error counting is formulated and a trial-and-error correction operation is developed based on error count reduction by successful trial corrections. (Author)

AD-623 127 See Fld. 14/2

AD-623 213 See Fld. 12/1

AD-623 616 See Fld. 12/1

AD-623 674 See Fld. 5/10

9/5. SUBSYSTEMS

AD-623 096 Div. 7/5
CFSTI Prices: HC $3.00 MF $0.75
ALLISON DIV GENERAL MOTORS CORP INDIANAPOLIS IND
MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMA-DYNAMIC POWER GENERATORS.
Quarterly technical summary rept. no. 9, 1 May31 Aug 65,
by R. T. Schneider, and F. G. Myers. 13 Sep 65, 52p. Rept. no. EDR-4400
Contract Nonr410400 Proj. arpa order 420
Unclassified report

See also AD-616 260.

Descriptors: (*Energy conversion, Magnetohydrodynamics), (*Magnetohydrodynamics, Fluid dynamic properties), Generators, Design, Heaters, Plasma medium, Operation, Measurement

A closed loop MPD power generation device was designed, constructed, and operated. Two modes of operation were observed--saturating and nonsaturating. The saturating mode is associated with low seeding ratios while the nonsaturating mode is associated with high seeding ratios and high leakage resistances. During operation, leakage resistances varied between 0.1 and 1.0 megohms. Of the two modes observed, only the saturating mode was investigated thoroughly. The observations were made under the following conditions: Pressure--slightly above atmospheric, Magnetic field--up to 21,500 gauss, Velocities--up to 250 m/sec at the channel entrance, Temperatures (static)--up to 1500K. For the saturating mode at these conditions, no nonequilibrium ionization was observed. Theoretical considerations indicate that to observe nonequilibrium ionization, runs should be made at lower pressures and higher velocities and temperatures than those stated previously. (Author)

AD-623 133 Div. 8/1
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA ANTENNA LAB
RADIATION FROM SOME PERIODIC STRUCTURES EXCITED BY A WAVEGUIDE.
Technical rept.,
by D. S. Karjala, and R. Mittra. Oct 65, 78p. Rept. no. 65-15 ,TR-7
Contract AF19 628 3819 Proj. 4600 Task 460004
AFCRL , 65-653
Unclassified report

Descriptors: (*Antenna radiation patterns, Waveguides), (*Waveguides, Excitation), Fourier analysis, Boundary value problems, Electromagnetic wave reflections, Dielectrics, Metal plates

The problem of radiation from a set of semi-infinite parallel plates, as well as those of radiation from uniform and modulated corrugated surfaces excited by a parallel plane waveguide, are solved exactly. The method used is an extension of the conventional mode matching technique so that it is applicable to open structures. A Fourier transform taken perpendicular to the plates and matching across the plane which separates the structure and the semiinfinite region into which it is radiating, taken together with certain periodicity properties of the unknown functions in the transform domain, allows generation of an infinite set of algebraic equations which may be solved exactly. From the solution of these equations nearly all results of interest may be obtained: the reflection coefficient, the mode coefficients, which represent the field in the structure, the radiation pattern, the k-beta diagram, and the amplitudes of the surface waves launched. Fairly extensive numerical results for these quantities were obtained. (Author)

AD-623 146 Div. 8/1 ,5/2 ,8/6
CFSTI Prices: HC $4.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A FOUR SIDED ARRAY OF ONE TURN HELICAL ANTENNAS AND THE EFFECTS OF GROUND PLANES.
Master's thesis,
by Wesley Thomas Diller, and John Benny Barton. Aug 65, 103p. Rept. no. GE/EE/65-3
Unclassified report

Descriptors: (*Helical antennas, Space communication systems), (*Space communication systems, Helical antennas), (*Aircraft antennas, Helical antennas), (*Omnidirectional antennas, Helical antennas), Antenna radiation patterns, Polarization, Electrical impedance, Radio communication systems, Electrical engineering, Radio waves, Propagation

The purpose is to develop an array, of 4 one turn helices, that gives circular polarization, omnidirectional coverage, and maximum power at 18 degrees above a ground plane. Free space radiation and terminal impedance are compared for several helices and parameter changes. Radiation is measured above a conducting plane, absorbent material and wire grids. Free space radiation from the array of center lead helices has omni-directional coverage and circular polarization within 4db. The radiation from the array above a wire grid is aligned near 18 degrees, has omni-directional coverage and circular polarization within 10db. (Author)

AD-623 206 Div. 8/1
CFSTI Prices: HC $3.00 MF $0.75
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
RADIATING SLOTS ON A DIELECTRIC FILLED WAVEGUIDE.
Annual rept. for 1 Jul 64-30 Jun 65,
by Bernard R. Cheo, and Louis Pelish. 1 Aug 65, 76p. Rept. no. TR-400-118
Contract DA49 186AMC183D
Unclassified report

Descriptors: (*Slot antennas, Antenna radiation patterns), (*Dielectrics, Waveguide slots), Electronic scanners, Resistance (Electrical), Attenuation, Ferrites, Dielectric properties

The use of dielectric filling in waveguide slot antennas is practiced mainly because of size and weight reduction. The equivalent circuits of a single radiating slot are discussed, and their lumped circuit elements determined. It is found that the behavior of a slot is retained while only the resonant length is shifted through dielectric loading. A new-method of achieving electronic scan of these antennas by continuous loading of a ferrite slab in the guide is discussed. Data are compiled on the propagation constants and losses of a uniform dielectric loaded waveguide over a wide range of operating conditions.

AD-623 357 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
IMPEDANCE MEASUREMENTS MADE ON A 600-OHM MULTIPLE-WIRE DELTA ANTENNA.
Technical note,
by Fred R. Ore. Aug 65, 16p. Rept. no. TN-3, RRL-285
Contract NObsr89229
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Antennas, Electrical impedance), Measurement, Graphics, Tables, Medium frequency, High frequency, Very high frequency, Standing wave ratios

The impedance of this antenna system remains acceptable over the frequency range of 1 to 32 Mc. The input VSWR is less than 2.3 over this frequency range. The marginal impedance occurs at a frequency of approximately 22 Mc. (Author)

AD-623 407 Div. 8/1 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB
SLOT ADMITTANCE FOR COMPRESSIBLE PLASMA LAYERS.
Scientific rept.,
by Janis Galejs. Sep 65, 40p. Rept. no. SR-11 ,RR-471
Contract AF19 628 2410 Proj. 4642 Task 464202
AFCRL , 65-717

Unclassified report

Descriptors: (*Slot antennas, Admittance), (*Plasma sheath, Slot antennas), Antenna radiation patterns, Dipole antennas, Plasma medium, Compressive properties, Waveguide slots, Dielectric properties, Antenna configurations

The admittance of a waveguide is calculated for radiation into a general two layer compressible plasma which is further specialized to represent a plasma sheath and also an ion sheath in the presence of a plasma halfspace. The antenna admittance is related by integrals to the electric fields in the waveguide aperture, which are assumed to be a sum of the principal waveguide mode and of surface wave fields which are supported in this plasma geometry. The compressibility of plasma has the largest effect on the slot admittance when the slot width is equal to an odd number of half wavelengths of surface waves, but significant changes occur only if the relative dielectric constant of the plasma is less than 0.2, and the ratio of the free space velocity of electromagnetic waves to the acoustic velocity is less than 300. Plasma losses and the presence of an ion sheath tend to lessen the compressibility effects. (Author)

AD-623 559 Div. 8/1 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
THE QUASI-STATIC FIELDS OF A HORIZONTAL MAGNETIC DIPOLE.
Research rept.,
by Peter R. Bannister. 1 Nov 65, 23p. Rept. no. USL-698
Proj. USL1 901 00 00 Task SF106 91 92 7077

Unclassified report

Descriptors: (*Dipole antennas, Antenna radiation patterns), (*Electric fields, Dipole antennas), Magnetic fields, Propagation, Loop antennas, Underground antennas, Integrals

The electric field components produced by a horizontal magnetic dipole are derived for the quasi-static range (absolute value of gamma sub o rho << 1) and z = h = 0. The magnetic field components which have previously been derived are included for completeness. The special cases of absolute value of gamma sub 1 rho > 1 and absolute value of gamma sub 1 rho < 1, and the effect of burying the transmitting and receiving dipoles are examined for both the electric and magnetic field components. Gamma sub 0 is the upper half space (free space) propagation constant. Gamma sub 1 is the lower half space (the earth) propagation constant. Rho is the radial distance in a cylindrical coordinate system.

AD-623 581 Div. 8/1
CFSTI Prices: HC $2.00 MF $0.50
TEXAS UNIV AUSTIN LAB OF MILLIMETER WAVE PROPAGATION AND ASTRONOMY
MILLIMETER RADOME ELECTRICAL DESIGN TECHNIQUES.
Semiannual engineering rept. no. 1, 1 Apr-30 Sep 65,
by Donald L. Purinton. 30 Sep 65, 26p. Contract AF33 615 2123

Unclassified report

Descriptors: (*Radomes, Millimeter waves), Extremely high frequency, Dielectric properties, Silicon compounds, Dioxides, Aluminum compounds, Oxides, Sandwich construction, Wave transmission, Polarization, Materials

Progress of an investigation to develop techniques for the design of electromagnetic windows having electrical and structural integrity in the frequency range from 40 Gc to 150 Gc is reported.

AD-623 656 Div. 8/1
CFSTI Prices: HC $3.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS ANTENNA LAB
DESIGN CURVES FOR BORESIGHT AND TRANSMISSION ANALYSIS OF SEVERAL RANDOM WALL STRUCTURES.
Rept. on Electronic Polarization Control,
by R. E. Van Doeren. 21 May 65, 52p. Rept. no. 1804-3
Contract NOw64 0293d

Unclassified report

Descriptors: Radomes, Wave transmission), (*Dielectrics, Wave transmission), Sheets, Sandwich panels, Panels (Structural), Design, Polorization, Radiofrequency power, Performance (Engineering), Errors, Radar antennas, Graphics

The qualitative relation between boresight-error characteristics of a streamlined radome and the planewave transmission properties of plane dielectric sheets and sandwiches is discussed. To minimize the boresight errors, a radome wall structure should be selected which has small values of d/d theta absolute value of T and d/ d theta (IPD), where , absolute value of T is the magnitude of the transmission coefficient, (IPD) is the insertion phase delay, and 0 is the angle of incidence. To facilitate the preliminary design of the radome wall structure, data on absolute value of T squared, d/ d theta absolute value of T and d/d thesa (IPD) are presented in graphical form for thin walls, half-wave walls, and sandwiches. The data cover a range of requencies and angles of incidence. It is noted that the properties of the radome wall structures considered here are significantly better for parallel polarization than for perpendicular polarization. This suggests that a useful reduction in boresight error could be obtained by automatically controlling the polarization of the radar antenna as it scans in various directions. (Author)

AD-623 115 See Fld. 20/3

AD-623 122 See Fld. 20/3

AD-623 142 See Fld. 10

AD-623 204 See Fld. 17/2

AD-623 288 See Fld. 9/1

AD-623 302 See Fld. 9/1

AD-623 470 See Fld. 9/1

AD-623 549 See Fld. 10

AD-623 570 See Fld. 10

AD-623 574 See Fld. 10

AD-623 577 See Fld. 10

AD-623 591 See Fld. 10

AD-623 651 See Fld. 5/1

AD-623 655 See Fld. 20/14

10. ENERGY CONVERSION (NON-PROPULSIVE)

AD-623 142 Div. 7/6 ,7/5
CFSTI Prices: HC $4.00 MF $0.75
ATOMICS INTERNATIONAL CANOGA PARK CALIF
BASIC RESEARCH IN THERMIONIC ENERGY CONVERSION.
Technical summary rept. for 1 Nov 64-31 Jul 65,
by C. Warner, and L. K. Hansen. Oct 65, 107p. Rept. no. AI-65-191
Contract Nonr319200

Unclassified report

Descriptors: (*Thermionic converters, Scientific research), Plasma physics, Electrons, Scattering, Ionization, Energy conversion, Cesium, Ionic current, Mathematical analysis

The report presents the result of work in a continuing program to investigate basic processes in thermionic energy conversion. It is primarily based on papers that were given at various thermionic conferences. The subjects discussed are: transport implications of spectroscopic diode measurements, review of thermionic converter plasma physics, theory of the ignited mode with spatial temperature variation, and a theory of the ignited mode assuming uniform temperatures. (Author)

AD-623 549 Div. 7/6 ,7/5
CFSTI Prices: HC $3.00 MF $0.50
AMERICAN CYANAMID CO STAMFORD CONN RESEARCH LABS
HYDROCARBON FUEL CELL ELECTRODES.
Progress rept. no. 1, 16 Jan-16 Jul 65.
Nov 65, 52p. Contract DA44 009AMC897T

Unclassified report

Descriptors: (*Fuel cells, Electrodes), (*Electrodes, Hydrocarbons), Performance (Engineering), Electrolytes, Phosphoric acids, Cathodes, Aliphatic compounds, Tests, Stability

The principle effort in the program was devoted to evaluating the standard American Cyanamid AA-1 electrode (9 mg Pt/sq cm) and modifications of it on hydrocarbon fuels and air at temperatures of 150-200C with phosphoric acid as the electrolyte in a matrix type fuel cell.

AD-623 570 Div. 7/6 ,7/5 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
THERMOELECTRIC MATERIALS.
Bi-monthly progress rept. no. 24, 1 Jan-1 Mar 63,
by J. W. Johnson. 15 Mar 63, 3p. Contract NObs77017 Proj. SRI SU2681

Unclassified report

See also AD-622 580.

Descriptors: (*Thermoelectricity, Materials), (*Electric power production, Thermoelectricity), Bismuth compounds, Sulfides, Resistance (Electrical), Liquid metals, Bismuth

A new cell was developed employing an atmosphere of hydrogen to determine the resistivity of bismuth metal from 300 to 750C. The hydrogen atmosphere prevented the formation of oxide on the metal, and the values obtained agree very well with those reported in the literature for this temperature range. After the determination of the resistivity of liquid bismuth metal had been completed, the atmosphere was changed to helium, dried by passage through silica gel and oxygen removed by copper turnings held at 800C. Bismuth sulfide additions to the liquid bismuth were then made in amounts which increased the atom percent sulfur in steps of 5 percent up to 35 atom percent sulfur. The resistivity was determined over the temperature range from the solidification point of the composition to 750C for each step.

AD-623 574 Div. 7/6 ,7/5 ,14/2 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
TITANIUM ALLOY MFG DIV NATIONAL LEAD CO NIAGARA FALLS N Y
THERMOELECTRIC MATERIALS.
Bi-monthly progress rept. no. 13, 1 Jan-28 Feb 62.
15 Mar 62, 9p. Contract NObs78326
Unclassified report

Descriptors: (*Thermoelectricity, Materials), (*Electric power production, Thermoelectricity), Ceramic materials, Titanium compounds, Dioxides, Zirconium compounds, Cerium compounds, Lithium compounds, Titanates, Silicates, Oxides, Preparation

The report covers preparation of ceramic test specimens, by both customary and unconventional methods, and preparation of materials.

AD-623 577 Div. 7/6 ,7/5
CFSTI Prices: HC $3.00 MF $0.75
GENERAL INSTRUMENT CORP NEWARK N J THERMOELECTRIC DIV
CHEMICAL FUELED THERMOELECTRIC GENERATOR.
Final rept.
30 Nov 62, 62p. Contract NObs78656
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Thermoelectricity, Generators), (*Slurry fuels, Thermoelectricity), Fluorine compounds, Chlorine compounds, Aliphatic compounds, Fuel injection, Furnaces, Fuel oil, Lithium alloys, Magnesium alloys, Aluminum alloys, Halogenated hydrocarbons

A proof-of-principle, thermoelectric device is described which is fueled with a high-energy (1875 calories per gram), high-density (1.8 grams per cubic centimeter) fuel slurry. Handling and storing the fuel for periods up to one year offered little difficulty; however, operating problems, such as fuel feed to the burner and ash removal from the burner, were not fully resolved. Two fuel feed systems were designed and tested; a gravity drop system which is suited to low power output devices of up to 5 watt electrical output and a pressurized, continuous fuel feed system which is suited to devices about 5 watts electrical output. The thermoelectric generator yielded the following data: eta thermoelectric modules = 4.95%, calculated; eta overall = 2.91%, measured; voltage and current = 0.7V at 8.8 amperes; and power out = 6.16 watts. (Author)

AD-623 591 Div. 7/6 ,7/5
CFSTI Prices: HC $3.00 MF $0.75
DU PONT DE NEMOURS (E I) AND CO INC WILMINGTON DEL PIGMENTS DEPT
HIGH TEMPERATURE THERMOELECTRIC GENERATOR.
Final rept. for 14 Jun 63-14 Sep 64,
by W. T. Hicks. 7 Dec 64, 97p. Contract NObs88639 Proj. SR007 12 01 Task 802
Unclassified report

See also AD-604 905.

Descriptors: (*Thermoelectricity, Generators), (*Generators, Thermoelectricity), Modules (Electronic), Semiconductors, Tungsten alloys, Selenium alloys, Lead alloys, Tellurium alloys, Gold alloys, Nickel alloys, Impurities, Tantalum, Sodium, Performance (Engineering), Encapsulation, Life expectancy, Copper alloys, Intermetallic compounds

Design, construction, and operation of a high temperature thermoelectric generator are reported. A commercial, gas-fired heat source was used. The generator elements comprise encapsulated segments of Ta-doped WSe2 and Na-doped PbTe as p-type materials. No appropriate n-type semiconductor was found; however, an Au-Ni alloy was discovered and developed for use in the generator as negative legs. Total power output and efficiency were less than those calculated. Suggestions for improving generator performance and for further materials research are included. (Author)

AD-623 660 Div. 7/6 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA UNIV PHILADELPHIA ELECTRO-CHEMISTRY LAB
REVERSIBLE OXYGEN ELECTRODES.
Quarterly rept. no. 1, 14 Apr-13 Jul 65,
by M. Genshaw, K. Wong, and A. Damjanovic. 13 Jul 65, 23p. Contract DA28 043AMC01291 (E) Proj. DA-1C0 14501 A34A Task 100 14501A34A00
Unclassified report

Descriptors: (*Fuel cells, Cathodes), (*Cathodes, Fuel cells), (*Oxygen, Reduction (Chemistry)), Electrodes, Gold, Hydrogen peroxide, Water, Oxidation-reduction reactions, pH

The mechanism of oxygen reduction on the surface of gold electrodes was studied using a rotating disk electrode with a ring. In acid solution hydrogen peroxide is the product of the reduction. In alkaline solutions hydrogen peroxide is an intermediate during the reduction. By oxidation and reduction small areas on the gold surface become more active and reduce oxygen directly to water. (Author)

10/3. ENERGY STORAGE

AD-623 329 Div. 7/1
CFSTI Prices: HC $4.00 MF $0.75
UNION CARBIDE CORP CLEVELAND OHIO ELECTROCHEMICAL PRODUCT DEVELOPMENT LAB
ALKALINE-MNO2 BATTERY.
Rept. no. 8 (Final), 1 May 62-31 Jan 65,
by J. Winger. 28 Jun 65, 105p. Contract DA36 039sc89098 Proj. 1C6 22001A053
Unclassified report

Available copy will not permit full legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-433 225.

Descriptors: (*Alkaline cells, Performance (Engineering)), (*Low-temperature batteries, Construction), Manganese compounds, Dioxides, Cathodes (Electrolytic cells), Electrolytes, Binders, Zinc, Life expectancy, Storage, Battery separators, Anodes (Electrolytic cells), Manufacturing methods

A lower ore/carbon ratio (4:1) was found to improve the low temperature service of the cathode generally 100 per cent. Mixing and molding parameters for optimum cathode manufacture were determined and a factory trial of low temperature cells was made. The cathode absorbed liquid during high temperature storage which reduced the packing. Addition of a binder corrected the problem and maintained the service improvement previously obtained. A 4 per cent binder level in the cathode was optimum and repeat laboratory trials confirmed the improvement in high temperature shelf life. The importance of cathode density was established as low temperature service was adversely affected by low density cathodes. Service life was also improved by using Pellon separator paper. Anode additives improved shelf life but reduced service at low temperature. Further work on cathode construction optimization showed that the type mixer used for LeClanche cells improved cell performance at low temperature but the handling characteristics of the mix were not practical from a manufacturing standpoint.

11/1. ADHESIVES AND SEALS

AD-623 130 **See Fld. 11/7**

AD-623 420 **See Fld. 6/3**

11/2. CERAMICS, REFRACTORIES, AND GLASSES

AD-623 208 Div. 14/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
VAPORIZATION OF PURE-OXIDE CERAMICS AT HIGH TEMPERATURES,
by E. S. Lukin, and D. N. Poluboianinov. 7 Oct 65, 18p. Rept. no. FTD-TT-65-934 TT, 65-64426
Unclassified report

Unedited rough draft trans. of Ogneupory (USSR) v29 n9 p418-24 1964.

Descriptors: (*Ceramic materials, Vaporization), (*Oxides, Ceramic materials), USSR, High-temperature research, Controlled atmospheres, Aluminum compounds, Beryllium compounds, Calcium compounds, Magnesium compounds, Zirconium compounds, Silicon compounds, Density, Reaction kinetics, Porosity

A method of investigating vaporization was developed which allowed the study the behavior of widely applied oxide ceramics at temperatures up to 2300C in a vacuum and in helium. At such temperatures all oxides vaporize, but in different manners depending upon their nature and the test conditions. One should look for the causes of the different vaporization of oxides in the crystalline structure of the substance itself, because vaporization depends on the type of crystalline grid and its energy and, consequently, is determined by the strength of the bond between atoms or ions of the substance. (Author)

AD-623 262 Div. 14/2 ,25/4
CFSTI Prices: HC $5.00 MF $1.00
TEXAS INSTRUMENTS INC DALLAS
NEW HIGH TEMPERATURE INFRARED TRANSMITTING GLASSES.
Final technical summary rept. for 1 May 62-31 Jul 65,
by A. Ray Hilton. 30 Sep 65, 168p. Rept. no. TT-08-65-121
Contract Nonr381000 Proj. arpa order 269
Unclassified report

Descriptors: (*Infrared optical materials, Glass), (*Glass, Infrared phenomena), (*Infrared windows, Materials), (*Heat-resistant materials, Infrared windows), Phase studies, Chalcogens, Optical properties, Spectra (Infrared), X-ray diffraction analysis, Mass spec-

troscopy, Refractive index, Absorption, Impurities, Molecular structure

Results obtained in the qualitative evaluation of glasses from seven IVA-VA-VIA ternary systems as high temperature infrared window materials are given. Four-component glasses formed from two ternary systems were prepared and characterized. The pertinent physical and physical properties of non-oxide chalcogenide glasses are summarized. Several specific glass compositions were fabricated in large pieces so that their optical and related physical properties could be accurately measured. The properties of a glass are determined by their constituent elements. The ratios between the constituent elements, and thus the location of the glass-forming region, are found to depend on the binary compounds which form between the constituent elements. (Author)

AD-623 121 **See Fld. 20/6**

AD-623 309 **See Fld. 20/6**

AD-623 313 **See Fld. 7/4**

AD-623 528 **See Fld. 20/12**

AD-623 574 **See Fld. 10**

AD-623 640 **See Fld. 18/8**

AD-623 653 **See Fld. 18/8**

11/3. COATINGS, COLORANTS, AND FINISHES

AD-623 244 **See Fld. 11/7**

AD-623 520 **See Fld. 20/6**

AD-623 521 **See Fld. 20/6**

AD-623 522 **See Fld. 20/6**

AD-623 523 **See Fld. 20/6**

AD-623 524 **See Fld. 20/6**

11/6. METALLURGY AND METALLOGRAPHY

AD-623 098 Div. 17/5
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO CHEMICAL ENGINEERING BRANCH
RELATIONS OF TENSILE STRENGTH AND HARDNESS OF STEEL,
by William A. Pennington. 14 Sep 65, 17p. Rept. no. ChE-45

Unclassified report

Descriptors: (*Steel, Tensile properties), Hardness, Curve fitting, Reinforcing materials, Carbon alloys, Data, Equations, Tables

Data relating Brinell Hardness Number to tensile strength of plain carbon and low-alloy steel (under 5 percent alloy) taken from ASM Handbook, Volume 2, 8th Edition, p. 670 (1964), have been used to develop three rather exact mathematical equations giving the hardness as a function of tensile strength. These equations have been employed to set up tabular data where the increment in the independent variable is constant thus leading to simpler and more reliable interpolations. It is anticipated that the data can be used for wrought steel products from tensile strengths of 50,000 psi up to about 265,000 psi for reinforcing bars for prestressed concrete. (Author)

AD-623 221 Div. 17/2
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS UNIV URBANA DEPT OF MINING METALLURGICAL AND PETROLEUM ENGINEERING
THE STUDY OF STABILIZATION EFFECTS IN BINARY AND TERNARY ALLOY SYSTEMS OF THE TRANSITION ELEMENTS.
Final rept. for 1 Oct 61-1 Oct 64,
by Paul A. Beck. 1 Oct 64, 5p. Contract DA ARO D31 124G155
AROD , 3306:6

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Transition elements, Alloys), (*Alloys, Transition elements), (*Phase studies, Alloys), Silicon alloys, Germanium alloys, Tin alloys, Aluminum alloys, Managenese alloys, Iron alloys, Chromium alloys, Stabilization

A study was made of the stabilization effects obtained with Si, Ge and Sn, as well as with Al in binary and ternary alloys with transition elements.

AD-623 222 Div. 17/2
ILLINOIS UNIV URBANA
THE PHYSICAL METALLURGY OF MARTENSITE AND BAINITE; A REPORT ON THE RECENT SCARBOROUGH CONFERENCE,
by C. M. Wayman. 1965, 4p.
AROD , 4643:3

Unclassified report

Pub. in Journal of Metals p930-34 Sep 1965 (Copies not available to DDC or Clearinghouse customers). Partly supported by AEC.

Descriptors: (*Martensite, Transformations), (*Bainite, Transformations), (*Symposia, Metallurgy), Thermodynamics, Mechanics, Steel, Titanium alloys, Copper alloys, Uranium alloys, Mechanical properties, Crystal lattices

The conference was concerned with the thermodynamic, kinetic, crystallographic, and mechanical properties aspects of martensitic and baintic transformations. Transformations in both ferrous and non-ferrous materials were considered. The report is intended to point out some of the highlights of the conference.

AD-623 399 Div. 17/7 ,17/2
CFSTI Prices: HC $2.00 MF $0.50
MARTIN CO ORLANDO FLA MATERIALS RESEARCH LAB
X-RAY STUDY OF WIRE-DRAWN NIOBIUM AND TANTALUM.
Technical rept.,
by R. P. I. Adler, and H. M. Otte. Sep 65, 32p. Rept. no. OR-6752 ,TR-12
Contract Nonr370600

Unclassified report

Descriptors: (*Niobium, Deformation), (*Tantalum, Deformation), X-ray diffraction analysis, Drawing (Machine processing), Crystal lattice defects, Stresses, Strain (Mechanics)

Deformation, introduced into Niobium (Nb) and Tantalum (Ta) specimens by wire drawing at room temperature, produced changes in the shape and position of X-ray diffraction peaks. The resultant peak profiles and locations of all available peaks were recorded using the DebyeScherrer geometry on a modified diffractometer with crystal monochromated CuK alpha sub 1 radiation. The amount of deformation in the surface layers of both metals was found to saturate essentially after only 20 percent reduction in area. The measured decrease in the lattice parameters of either material was attributed to a residual surface stress; the average value for the deformed saturated state for both Ta and Nb wires corresponded to an equivalent longitudinal tensile stress of 35 = 5 kg. per sq. mm. Integral breadth measurements revealed approximately equal X-ray particle sizes in the <100> and <110 > directions; the minimum particle size for the microstructures of both metals was around 200A and occurred after the first few draws. (Author)

AD-623 543 Div. 17/7 ,17/4
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF ENGINEERING RESEARCH
THE PHASES WITH THE BORON COORDINATION NUMBER 8 IN THE SYSTEM COBALT-VANADIUMBORON (DIE PHASEN MIT DER BORKOORDINATIONSZAHL 8 IM SYSTEM KOBALT-VANADIUM-BOR,
by Hans H. Stadelmaier, and John G. Avery. 5 Mar 65, 5p.
AROD , 5010:3

Unclassified report

Pub. in Zeitschrift fur Metallkunde v56 (S8) p508-11 (West Germany) 1965 (Special ed.). (Copies available only to DDC users). Text in German, summary in English.

Descriptors: (*Cobalt alloys, Phase studies), (*Vanadium alloys, Phase studies), (*Boron alloys, Phase studies), Crystal lattices, Solubility

The cobalt-rich alloys in the system cobalt-vanadiumboron exhibit two borides with the same coordination number around the boron atom, namely the solid solution of vanadium in Co2B and a ternary phase with the Cr23C6 structure. In the cobalt-rich corner of the ternary system a liquidus projection and an isothermal section at 800C were worked out. The solubility of vanadium in Co2B at 800C is 8 at.-%. The substitution of vanadium in Co2B is accompanied by an increase in the tetragonal lattice parameters a and c but a decrease in the axial ratio c/a. The correlation between the average number of outer electrons and the axial ratio for this structure is discussed by means of several examples. At 800C the congruently melting ternary phase extends from Co21V2B6 to Co20V3B6 and its boron content remains practically stoichiometric. Its lattice constant also increases with increasing vanadium content and, for alloys quenched from 800C, lies between 10.47 sub 6 and 10.49 sub 7. (Author)

AD-623 566 Div. 17/5 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
CONDITIONS OF FAILURE IN FATIGUE CRACKED 4340 STEEL.
Final rept.,
by E. P. Klier. 7 Oct 65, 17p. Rept. no. NRL-6317
Contract AT49 5 2110 Proj. RR007 01 46 5409,SR007 01 01 0858

Unclassified report

Descriptors: (*Steel, Fracture (Mechanics)), (*Fracture (Mechanics), Steel), Tensile properties, Failure (Mechanics), Heat treatment, Hardness, Toughness, Plasticity, Deformation, Transition temperature

For a fatigue-cracked tension specimen, the conditions of plastic failure, i.e., the stress conditions under which the section under the notch becomes plastic, have been developed by Hill. The analysis assumes the material to be ideally plastic, but, nonetheless, should be adequately approximate for heat-treated 4340 steel. Tension tests have been

completed, and the results have been used to predict the notch strength for 4340 steel heat-treated to strength levels characteristic for this steel. The calculated notch strengths have been compared with the notch strengths which were earlier measured and reported. For limited conditions the calculated and measured values are found to be in adequate agreement. Differences in the calculated and measured values in the plastic failure interval can be attributed to the strain-hardening to which the 4340 steel is subject. The conventional tensile properties of 4340 steel at the several strength levels examined agree with the data in the literature except that the ductility is reduced. The true-stress natural-strain data indicate a transition in the strain-hardening exponent (n) from high to low values as the tensile strength increases from the minimum to the maximum values measured.

AD-623 567 Div. 17/2 ,25/6
CFSTI Prices: HC $4.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
ELECTRON MICROSCOPE FRACTURE EXAMINATION TO CHARACTERIZE AND IDENTIFY MODES OF FRACTURE.
Final rept.,
by C. D. Beachem. 28 Sep 65, 124p. Rept. no. NRL-6293
Proj. 7381

Unclassified report

Descriptors: (*Fractography, Alloys), (*Aluminum alloys, Fracture (Mechanics)), (*Steel, Fracture (Mechanics)), (*Titanium alloys, Fracture (Mechanics)), Electron microscopy, Fatigue (Mechanics), Surface properties, Failure (Mechanics), Microstructure

The fine-scale fracture topographies of both monotonic and fatigue fracture surfaces of several steels and aluminum and titanium alloys have been characterized. Some effects of orientation of specimen upon the fatigue crack surface appearance in 2024 T851 were found. Quasicleavage in hydrogen embrittled, 250,000 psi yield strength, maraging steel was discovered. Four overload fracture modes, including a previously unreported mode, were found in a 7075 T6 aluminum alloy by precision matching techniques. A number of failure analyses were made. (Author)

AD-623 571 Div. 17/7 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)
HIGH MAGNETIC FIELD SUSCEPTIBILITY OF CHROMIUM.
Technical rept.,
by Richard Stevenson. Nov 65, 5p. Contract Nonr301300 Proj. NR018 503

Unclassified report

Descriptors: (*Chromium, Magnetic properties), Magnetic fields, Measurement

The magnetic susceptibility of chromium metal has been measured in pulsed fields up to 400 koer. Decreases in the susceptibility are observed at about 270 koer and 330 koer. (Author)

AD-623 594 Div. 17/2 ,25/2
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS INST OF TECH CHICAGO DEPT OF METALLURGICAL ENGINEERING
GRAIN BOUNDARY MIGRATION.
Technical rept.,
by Paul Gordon. Oct 65, 47p. Rept. no. TR-1 Contract DA ARO D31 124G597 Proj. DA20014501B32D
AROD, 5030:1

Unclassified report

Descriptors: (*Grain boundaries, Metallography), (*Grain structures (Metallurgy), Metals), Alloys, Crystal lattice defects, Impurities, Crystals, Motion, Diffusion

Main results of boundary migration studies in polycrystalline materials are delineated. The effect of orientation and boundary structure factors and their interdependence with impurity effects are considered. Investigations aimed at the quantitative understanding of the drastic effect dissolved impurities have on boundary migration are examined. Results of these investigations are compared with the predictions of migration rate theories designed to account quantitatively for the impurity effect. (Author)

AD-623 596 Div. 17/2
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN SOCIETY OF MECHANICAL ENGINEERS NEW YORK
A RESEARCH STUDY ON INTERNAL CORROSION OF HIGH PRESSURE BOILERS.
Progress rept. no. 1,
by H. A. Klein, and J. K. Rice. 1965, 13p. Contract NObs92280

Unclassified report

Prepared for preparation at the Winter Annual Meeting of the American Society of Mechanical Engineers, Chicago, Ill., 7-11 Nov 65. Prepared in cooperation with Combustion Engineering, Inc., Windsor, Conn. and Cyrus W. Rice Co., Pittsburgh, Pa.

Descriptors: (*Corrosion, Boilers), (*Boiler tubes, Corrosion), Steel, Pressure

The primary goal of this test program is to determine the cause and practical preventive solutions for the type of internal corrosion commonly experienced in units operating at pressures between 800-2600 psig. Such corrosion usually predominates in furnace wall tubes which are subject to a high rate of heat transfer. Attack is normally restricted to the hot side of the tube where boiling occurs.

AD-623 600 Div. 17/4 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
TITANIUM METALS CORP OF AMERICA NEW YORK
DEVELOPMENT OF A STABLE-BETA TITANIUM ALLOY.
Quarter rept. no. 10, 1 Oct-31 Dec 64,
by D. B. Hunter. 31 Dec 64, 22p. Contract DA30 069ORD3743 Proj. DA59332008
WAL, TR-405/2-9

Unclassified report

Descriptors: (*Titanium alloys, Dispersion hardening), (*Dispersion hardening, Titanium alloys), Vanadium alloys, Iron alloys, Cobalt alloys, Aluminum alloys, Molybdenum alloys, Heat treatment, Aging (Materials), Tensile properties, Creep, Oxidation, Corrosion, Stresses

Evaluation of ageable beta alloys Ti-17V-2Fe-2Co-3Al, Ti-17V-7 .5Co-3Al and Ti-8Mo-8V-5Co-3Al continued with room and elevated temperature smooth and notched tensile tests, creep stability, oxidation and stress-corrosion tests. Ti-17V-7 .5Co-3Al aged more rapidly than Ti-8Mo-8V-5Co3Al; after aging for 8 hours at 900F, Ti-17V-7 .5Co-3Al had a yield strength of 198,000 psi, whereas that of Ti8Mo-8V-5Co-3Al was only 158,000 psi. In smooth and notched tensile tests at 600F, Ti-17V-7 .5Co-3Al displayed more strength than Ti-8Mo-8V-5Co-3Al because of its faster aging response in a given time. However, in creep stability tests and oxidation tests, Ti-8Mo-8V-5Co-3Al was the better alloy. Stress corrosion tests performed upon all five ageable beta alloys developed in this project showed that, in the annealed condition, Ti-8Mo-8V-2Fe-3Al was the most resistant to stress corrosion and Ti-17V-7 .5Co-3Al and Ti-8Mo-8V-5Co-3Al the most susceptible. (Author)

AD-623 138 See Fld. 9/1

AD-623 143 See Fld. 21/8

AD-623 300 See Fld. 13/4

AD-623 588 See Fld. 13/8

AD-623 611 See Fld. 14/2

AD-623 640 See Fld. 18/8

AD-623 680 See Fld. 11/8

11/7. MISCELLANEOUS MATERIALS

AD-623 128 Div. 14/6 ,1/3
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA UNIV RESEARCH INST NORMAN
DYNAMIC ELASTIC, DAMPING, AND FATIGUE CHARACTERISTICS OF FIBERGLASS-REINFORCED SANDWICH STRUCTURE.
Final rept.,
by Gene M. Nordby, W. C. Crisman, and Charles W. Bert. Oct 65, 94p. Contract DA44 177AMC164T Task 1P121401A14176
USAAVLABS, TR-65-60

Unclassified report

Descriptors: (*Laminated plastics, Composite materials), (*Composite materials, Sandwich construction), (*Glass textiles, Reinforcing materials), (*Sandwich panels, Honeycomb cores), Airplane panels, Epoxy plastics, Aluminum alloys, Phenolic plastics, Foils, Elasticity, Damping, Fatigue (Mechanics), Structural properties, Structures, Mathematical analysis

Research was conducted to determine the basic dynamic properties of fiberglass-reinforced plastic (FRP) sandwich structure suitable for use as a primary airframe structural material. The research program was carried out in two separate parts: (A) determining dynamic moduli and damping, and (B) determining fatigue behavior. In each part, two types of hexagonalcell honeycomb core materials were investigated: 5052 aluminum foil and HRP (heat resistant phenolic) fiberglass. (Author)

AD-623 130 Div. 14/6 ,14/8 ,14/1
CFSTI Prices: HC $5.00 MF $1.00
NARMCO RESEARCH AND DEVELOPMENT DIV WHITTAKER CORP SAN DIEGO CALIF
MECHANICAL RELATIONSHIP OF REINFORCEMENTS AND THE BINDER MATRIX.
Final rept. for 10 Jun 64-1 Mar 65,
by Juan Haener. Sep 65, 163p. Contract DA44 177AMC208T Task 1P125901A14203
USAAVLABS, TR-65-58

Unclassified report

Descriptors: (*Composite materials, Mechanical properties), (*Binders, Reinforcing materials), Plastics, Microstructure, Loading (Mechanics), Matrix algebra, Boundary value problems

The mechanical interactions between reinforcement and matrix in a composite under load have been described by stress distribution equations in the fibers and in the matrix. Although special attention has been given to stresses resulting from polymerization and temperature shrinkage, the solutions obtained can be easily adapted for use with the boundary conditions of external loads. Several cases were considered: (1) a cylindrical filament of finite length embedded in a resin cylinder; (2) a cylindrical filament of infinite length embedded in a resin cylinder; and (3) a matrix supporting a central fiber surrounded by six symmetrically spaced fibers, each in turn surrounded by six others. (Author)

AD-623 244 Div. 14/6 ,14/8 ,14/7
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
A SOVIET STUDY OF TEFLON-BASED ANTI-FRICTION MATERIALS: SUMMARY OF DATA.
Rept. no. 29 on AID Work assignment no. 28,
by A. P. Semenov, R. M. Matveevskii, and V. V. Pozdnyakov. 17 Apr 64, 19p. Rept. no. aid-U-64-25
TT , 65-64455

Unclassified report

Partial trans. and abstracts of mono. Tekhnologiya Izgotovleniya i Svoistva Soderzhashchikh Ftoroplast Antifriktsionnykh Materialov; Osnovnye Printsipy Proizvodstva, Moscow, 1963 64p.

Descriptors: (*Halocarbon plastics, Friction), (*Composite materials, Friction), (*Friction, Composite materials), Lubrication, Plastic coatings, Steel, Bronze, Impregnation, Physical properties, Mechanical properties, Abstracting, USSR, Bearings

Contents: comparative tests for friction of various plastics with and without lubrication, some information on physiocochemical, mechanical, and technological properties of ftoroplast-4, possible ways of utilization of the properties of ftoroplast-4 in the manufacture of antifriction materials and coatings, a review of the available information on the use of ftoroplast-4 in antifriction materials, the possible technological schemes of the manufacture of complex-composition antifriction materials containing ftoroplast-4, and technology of the manufacture of a strip material consisting of steel-porous bronze impregnated with ftoroplast-4.

AD-623 316 Div. 14/6 ,30/5
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE MATERIALS LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
EXPERIMENTAL METHODS FOR DETERMINING SHEAR MODULUS OF FIBER REINFORCED COMPOSITE MATERIALS.
Technical rept. for Jul-Dec 64,
by J. M. Hennessey, James M. Whitney, and M. B. Riley. Sep 65, 57p. Rept. no. ML-TR-65-42
Proj. 7340 Task 734003

Unclassified report

Descriptors: (*Composite materials, Shear stresses), (*Loading (Mechanics), Composite materials), Fibers, Reinforcing materials, Structures, Mathematical analysis, Stresses, Strain (Mechanics), Test methods, Deformation, Structural properties, Buckling (Mechanics), Laminates, Structural shells, Elasticity

The report presents four acceptable methods for determining the shear modulus of orthotropic materials. Two methods are appropriate for determining in-plane shear modulus and two others are for determining 'bending' shear modulus which is applicable in calculating buckling loads of laminated plates and shells. A discussion of each method precedes the method of experimental determination. The derivation of all pertinent equations are presented.

AD-623 517 Div. 14/6
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE MATERIALS LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
FILAMENTOUS CARBON AND GRAPHITE.
Technical rept. for Jul 64-Mar 65,
by D. L. Schmidt, and H. T. Hawkins. Aug 65, 45p. Rept. no. AFML-TR-65-160
Proj. 7340 Task 734001

Unclassified report

Descriptors: (*Composite materials, Refractory materials), (*Carbon, Fibers), (*Graphite, Fibers), (*Fibers, Reinforcing materials), Refractory coatings, Filaments, Pyrolitic graphite, Pyrolysis, Textiles, Coatings, Vapor plating, Plastics

Constructive pyrolysis of fibered organic materials yields a corresponding carbon or graphite fibrous product which is flexible, thermally stable, nonmelting, strong, lightweight, and chemically inert. These novel fibers have been used as reinforcing agents in structural, ablative, and pyrolyzed plastics, and the composites thereof exhibit a combination of properties not previously obtainable. Recent methods for improving fiber properties are given. These include both vat-dipping and pyrolytic vapor deposition techniques. Property data on improved fibers are also listed. (Author)

AD-623 644 Div. 14/6
CFSTI Prices: HC $5.00 MF $1.00
ROCKETDYNE CANOGA PARK CALIF RESEARCH DEPT
MICROMECHANICS OF FIBER-REINFORCED COMPOSITES.
Rept. for 1 Jul 64-30 Jun 65,
by E. L. Alexander, A. A. Caputo, M. E. Prado, and J. E. Hilzinger. Nov 65, 160p. Rept. no. R-6260
Contract AF33 615 1627 Proj. 7340 Task 734003
ML , TR-65-283

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Composite materials, Loading (Mechanics), (*Fibers, Reinforcing materials), Boron, Photoelasticity, Mechanical properties, Stresses, Mathematical analysis, Structures, Beams (Structural), Failure (Mechanics), Metal plates, Deformation, Buckling (Mechanics)

Research on the micromechanical behavior of composites reinforced with boron and other fibers is reported. A wide variety of reinforcing elements were used in photoelastic matrix materials to form beams, plates, and three-dimensional microspecimens of varied configurations. The effects of reinforcing element modulus and elongation were investigated in beams in four- and three-point loading. The degree of stiffening derived from various filament reinforcing materials was defined, and different failure mechanisms were investigated. Reinforced plates were biaxially tested, and fiber unbonding, buckling, and the subsequent stress redistribution were observed photoelastically. Significant advances in microphotoelasticity are reported. Very small specimens were loaded, and sharp microscopic photoelastic stress patterns (including induced flaw points) were photographed. The filament configurations represent typical laminate geometries, and small flaws were seen to have a remarkably wide field of influence. (Author)

AD-623 264 **See Fld. 20/6**

AD-623 327 **See Fld. 20/12**

AD-623 475 **See Fld. 7/4**

AD-623 520 **See Fld. 20/6**

AD-623 521 **See Fld. 20/6**

AD-623 522 **See Fld. 20/6**

AD-623 523 **See Fld. 20/6**

AD-623 524 **See Fld. 20/6**

11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-623 241 Div. 14/3 ,10/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
NAPHTHENIC CRUDES OF NORTH CAUCASIA AS POSSIBLE SOURCES OF T-5 FUEL: SUMMARY OF DATA.
Rept. no. 26 on AID Work assignment no. 28,
by E. S. Levchenko, E. N. Bobkova, and E. A. Ponomareva. 24 Mar 64, 13p. Rept. no. aid-U-64-18
TT , 65-64452

Unclassified report

Partial trans. and summary of mono. Nefti Severnogo Kavkaza, Moscow, 1963 336p.

Descriptors: (*Petroleum, USSR), (*Jet engine fuels, USSR), Economic geology

The reference book contains the results of a long-term (1936-1961) study of North Caucasia, that is, the ChechenoIngushetia, Dagestan, Stavropol' and Krasnodar Regions, completed at the Krasnodar Branch of the VNIINeft'. Data on the physical and chemical properties, potential fraction content, yields and properties of various petroleum products or their components are given in 851 tables for 67 oil fields. The book was written for engineers and technicians of the petroleum industry, geological surveys, planning and design institutions, and for teachers and students of the petroleum VUZes. Locations of the fields are given on four maps. (Author)

AD-623 248 Div. 14/5 ,10/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
CURRENT INFORMATION ON FUELS AND LUBRICANTS: COMPILATION OF ABSTRACTS.
Rept. no. 30 on AID Work assignment no. 28.
12 May 64, 13p. Rept. no. AID-U-64-37
TT , 65-64459

Unclassified report

Contains potentially useful material on fuels and lubricants in the form of informative abstracts. Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Fuels, Reviews), (*Lubricants, Reviews), USSR, Liquid metals, Jet engine fuels, Oils, Additives, Greases, Bibliographies

AD-623 484 Div. 14/5
CFSTI Prices: HC $3.00 MF $0.75
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
FUNDAMENTAL INVESTIGATION OF MOLYBDENUM DISULFIDE AS A SOLID LUBRICANT.
Final technical rept. for 23 Jul 64-22 Jul 65,
by J. C. Tyler, and P. M. Ku. 23 Aug 65, 69p.
Rept. no. RS-460
Contract NOw64 0545f

Unclassified report

Descriptors: (*Lubricants, Powders), (*Molybdenum compounds, Lubricants), (*Sulfides, Lubricants), Test equipment, Controlled atmospheres, Compressive properties, Adhesion, Pressure, Hardness, Tensile properties, Elasticity

A basic test facility for performing compression, tension, torsion, cohesion, adhesion, and sliding experiments on cylindrically shaped molybdenum disulfide (MoS2) specimens in a controlled atmosphere or in vacuum was designed, fabricated, and put into operation. Compacts of a reference MoS2 powder and a commercially available MoS2 powder were made, without the use of a binder, over a wide range of compacting pressures and length-

to-diameter ratios. Data were obtained on the variations of compact specific gravity and hardness with respect to compacting pressure and length-to-diameter ratio. Measurements were also made on the compressive and tensile properties of the MoS2 specimens in clean dry air and at room temperature. The ultimate compressive and tensile strength were determined over a wide range of specimen specific gravities, as were the moduli of elasticity in compression and tension. (Author)

AD-623 680 Div. 14/5 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
SPRINGFIELD ARMORY MASS
EFFECT OF METAL-WORKING LUBRICANTS ON TOOL STEELS AND CARBIDES.
Technical rept.,
by M. S. Spivak. 8 Nov 65, 18p. Rept. no. SA-TR16-1063
Proj. DA M5 4P0010 01M5M6
Unclassified report

Descriptors: (*Cutting tools, Degradation), (*Cutting fluids, Corrosion), Tool steel, Carbides, Powder metals, Zirconium alloys, Boron alloys, Chromium alloys, Carbide tools, Lubricants, Mineral oils, Surface properties, Films

Experiments were conducted to determine the effect of mineral oils and a number of cutting oil-mineral oil solutions on solid tool steels, solid carbide inserts, and powdered carbides at elevated temperature. Other metallic powders such as zirconium boride and chromium boride were included in the investigation. Mineral oils alone did not react with the tool steels. However, when combined with cutting oils and cutting-oil concentrates, insoluble films formed on the polished surfaces. VV-O-241 Grade 2 mineral oil appeared to attack the polished surface of the carbides tested, whereas technical grade paraffin oil had little effect. Combinations of pure mineral oil, cutting oils, and cutting-oil concentrates appeared to attack the carbide specimens to a greater extent than the VV-O-241 Grade 2 mineral oil. Results obtained with the powders showed a gain of weight in most powders treated. This indicated that some reaction did occur; however, the mechanism of the reaction was not determined. Test procedures are described and results discussed. (Author)

AD-623 336 **See Fld. 22**

11/9. PLASTICS

AD-623 317 Div. 14/8
CFSTI Prices: HC $2.00 MF $0.50
STRUCTURAL MECHANICS RESEARCH LAB UNIV OF TEXAS AUSTIN
THE EFFECTS OF SHAPE OF LOAD PULSE ON SHOCK-MITIGATING CHARACTERISTICS OF A STYROFOAM PLASTIC,
by Robert I. Carr, Ervin S. Perry, E. A. Ripperger, and J. Neils Thompson. Jul 65, 40p. Contract DA22 079eng393
Unclassified report

Descriptors: (*Styrene plastics, Expanded plastics), (*Expanded plastics, Shock (Mechanics)), Stresses, Strain (Mechanics), Loading (Mechanics), Compressive properties, Impact shock

The dynamic cushioning characteristics of confined specimens of Styrofoam HD-1 are presented in the form of stress-strain curves and stress-time curves. The specimens demonstrated identical stress-strain curves from various impulse loadings on the HYGE shock tester and from static tests. Variations in the rise time and pulse durations of the HYGE wave forms were accompanied by like variations in rise times and durations of the crushing stress-time curves. Styrofoam HD-1 crushed initially at approximately 46 psi and bottomed at about 50 per cent strain with an energy dissipation at bottoming of approximately 3 ft-lb per cubic inch. (Author)

AD-623 088 **See Fld. 7/3**

AD-623 130 **See Fld. 11/7**

AD-623 244 **See Fld. 11/7**

AD-623 300 **See Fld. 13/4**

AD-623 307 **See Fld. 7/3**

AD-623 640 **See Fld. 18/8**

AD-623 653 **See Fld. 18/8**

11/10. RUBBERS

AD-623 289 Div. 14/9
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
THE CROSSLINKING OF SILOXAZANE ELASTOMERS.
Technical rept.,
by Frank B. Testroet. Aug 65, 14p. Rept. no. RIA-65-1956
Proj. DA 1C024401A110
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Heat-resistant materials, Elastomers), (*Elastomers, Silicon compounds), (*Silicon compounds, Elastomers), (*Organic nitrogen compounds, Elastomers), Siloxanes, Additives, Aging (Materials), Vulcanizates, Porosity, Stability, Heat treatment, Gamma rays, Molecular structure

The objective of this work was to discover means of crosslinking elastomers containing silicon-nitrogen (silazane) bonds in the main chain. The novel character of siloxazane elastomers presented the problem of finding effective curing systems since only limited work in this area had been reported. A screening program was undertaken to evaluate various means of crosslinking the siloxazanes. Crosslinking was achieved by means of thermovulcanization, gamma radiation and several chemicals. However, these vulcanizates were not entirely satisfactory since they were tacky, porous and hydrolytically unstable. (Author)

11/12. WOOD AND PAPER PRODUCTS

AD-623 506 Div. 14/10,32/3
CFSTI Prices: HC $2.00 MF $0.50
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y QRC BRANCH
DOCUMENT DESTRUCTION.
Final rept. for Jan 63-Feb 65,
by Vincent N. Rice, and Lewis C. Miller. Oct 65, 29p. Proj. 5534 Task 553402
RADC , TR-65-362
Unclassified report

Descriptors: (*Reports, Disposal), (*Paper, Disposal), Military intelligence, Dacron, Styrene plastics, Organic solvents, Smokes, Water, Heating

The results of tests that were conducted with various types of paper and substitute materials are as follows. Destruction by burning and shredding has a drawback in that the weight of equipment that would be required for destruction for RADC applications would be too much. Other problems encountered were the production of a large amount of smoke with burning of large amounts of paper and clogging of the shredder. Too long a period of time would also be required for complete destruction in application of both techniques. Of the synthetic materials, polystyrene is the best material encountered for RADC intended use. The principal advantage is that polystyrene can be destroyed rapidly in a wide range of organic liquids. The problems involving bending and tearing can be solved with sufficient development. Special grades of 59AF, 58A, and 59F (with viscose stable fibers) meet the specifications as a replacement for bond paper. They can be destroyed very rapidly in both water and by burning. The burning of 59AF, however, produces a lot of smoke which in some instances might be very undesirable. In comparing 59AF with polystyrene the main advantage lies in the fact that 59AF has a more paperlike characteristic than polystyrene and could probably take printing from type with more ease.

12/1. MATHEMATICS AND STATISTICS

AD-623 092 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
AN ALGORITHM FOR SEPARABLE CONVEX PROGRAMMING UNDER LINEAR EQUALITY CONSTRAINTS.
Technical paper,
by James E. Falk. Mar 65, 23p. Rept. no. RAC-TP-148
Unclassified report

Descriptors: (*Nonlinear programming, Theory), Functions, Vector analysis, Optimization, Programming (Computers), Taylor's series

AD-623 093 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
THE SEQUENTIAL UNCONSTRAINED MINIMIZATION TECHNIQUE FOR CONVEX PROGRAMMING WITH EQUALITY CONSTRAINTS.
Technical paper,
by Anthony V. Fiacco, and Garth P. McCormick. Apr 65, 26p. Rept. no. RAC-TP-155
Unclassified report

See also PB-167 599.

Descriptors: (*Nonlinear programming, Sequential analysis), (*Sequences, Nonlinear programming), Theory, Functions, Vector analysis, Numerical analysis, Taylor's series

This paper extends the sequential unconstrained minimization technique for nonlinear programming to include problems where the constraints are a mixture of inequalities and equalities. Theorems indicating the dual nature of the method and the solution of a subproblem are given. Finally, the theoretical basis for a k-point extrapolation procedure is established. (Author)

AD-623 094 Div. 15/1 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
OPTIMAL DECISION RULES FOR THE E MODEL OF CHANCE-CONSTRAINED PROGRAMMING.
Technical paper,
by Abraham Charnes, and Michael J. L. Kirby. Jul 65, 39p. Rept. no. RAC-TP-166
Unclassified report

Prepared in cooperation with Northwestern Univ., Evanston, Ill.

Descriptors: (*Linear programming, Model theory), (*Stochastic processes, Linear programming), (*Mathematical programming,

Management planning), Decision theory, Dynamic programming, Optimization

The first five sections of this paper contain an introduction to the topic of chance-constrained programming. Then the general n-period expectation-objective model of chance-constrained programming is presented and certain necessary conditions are established for decision rules to be optimal for such a model. The question of the consistency of the constraints and the finiteness of the optimal value of the objective function for such problems is discussed and several methods of resolving these questions are presented. The simplification that results when the chance-constrained problem is treated as a problem of linear programming under uncertainty is also discussed. The paper is concluded by solving two two-stage problems. (Author)

AD-623 097 Div. 15/1 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
MODULAR DESIGN, GENERALIZED INVERSES, AND CONVEX PROGRAMMING.
Technical paper,
by Michael J. L. Kirby, and Abraham Charnes.
Jul 65, 19p. Rept. no. RAC-TP-157
Contract DA44 188AR01 Proj. NIH EF 00355 01,NIH WP00019 04
Unclassified report

Prepared in cooperation with Northwestern Univ., Evanston, Ill., Contract Nonr122810.

Descriptors: (*Nonlinear programming, Design), (*Systems engineering, Optimization), Operations research, Functions, Matrix algebra, Linear programming, Equations, Transformations (Mathematics), Functional analysis

It is shown that a modular design problem can be transformed into a problem of minimizing a separable convex function subject to linear equality constraints and nonnegativities. This transformation is effected by using a generalized inverse of the constraint matrix. Moreover the nature of the functional and the constraints of the separable problem are such that a good starting point for its solution can be obtained by solving a particular transportation problem. Several possible methods for solving the separable problem are discussed, and the results of our computational experience with these methods are given. It is also shown that the modular design problem can be viewed as a special case of a large class of general engineering design problems that have been discussed in the literature. (Author)

AD-623 124 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.75
NEW YORK STATE UNIV STONY BROOK COLL OF ENGINEERING
THE DISTRIBUTIONAL HANKEL TRANSFORMATION.
Scientific rept.,
by A. H. Zemanian. 9 Aug 65, 61p. Rept. no. 44 ,SR-7
Contract AF19 628 2981 Proj. 5628 Task 562806
AFCRL , 65-646
Unclassified report

Descriptors: (*Integral transforms, Distribution theory), (*Distribution theory, Integral transforms), Topology, Functional analysis, Operators (Mathematics)

The Hankel transformation is generalized in a distributional way, something that apparently has not been done before. Two different procedures are used to accomplish this. In the first procedure a topological linear space of testing functions is constructed for which the mu-th order Hankel transformation is a topological automorphism. The dual space consists of the mu-th order Hankel-transformable distributions. The distributional Hankel transformation is then defined by generalizing a variation of Parseval's formula. It turns out that the distributions to which this transformation may be applied must be of slow growth. The second procedure yields a more general result in that there is no restriction on the rate of growth of the distributions that are to be transformed. Here again, Parseval's formula is used to define the generalized Hankel transformation, but in contrast to the previous case the testing functions for the distributions under consideration are required to have bounded supports. The Hankel transforms then turn out to be continuous linear functionals on certain classes of analytic functions. Several applications to differential equations containing Bessel-type differential operators are also given. (Author)

AD-623 213 Div. 15/1 ,8/7
NEW YORK UNIV N Y
ON THE INTERLEAVING OF TWO-LEVEL PERIODIC BINARY SEQUENCES,
by Karl N. Levitt, and Jack K. Wolf. 1965, 6p.

AROD , 4949:1
Unclassified report

Pub. in Proceedings of the National Electronics Conference v21 p644-9 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sequences, Communication theory), Statistical functions, Polynomials, Signals, Coding, Errors, Corrections

Periodic binary sequences play an increasingly important role as information carriers in communication systems. The autocorrelation functions of sequences derived by the arbitrary n-fold interleaving of the same two-level sequence are considered.

AD-623 216 Div. 15/1 ,15/2
CFSTI Prices: HC $3.00 MF $0.75
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
OPTIMAL EXPERIMENTAL DESIGNS.
Technical rept.,
by Samuel Karlin, and William J. Studden. Oct 65, 74p. Rept. no. mimeograph series no. 57
Contract Nonr110026
Unclassified report

Prepared in cooperation with Stanford Univ., Calif. Contract Nonr22528; Grant NSF GP2487.

Descriptors: (*Optimization, Combinatorial analysis), (*Combinatorial analysis, Optimization), Design, Statistical functions, Measure theory, Game theory, Functional analysis, Matrix algebra

This paper presents a number of results concerning the theory of the optimal design of experiments initiated and principal developed by Elfving, Kiefer and Wolfowitz. The paper contains approximately half expository and half new material. The proofs are mostly new and presented in a unified manner. The paper contains material on the estimation of linear functions of the regression parameters, extrapolation, minimax estimation, admissible designs and some quadratic loss problems. (Author)

AD-623 217 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
ON SOME SELECTION AND RANKING PROCEDURES WITH APPLICATIONS TO MULTIVARIATE POPULATIONS.
Technical rept.,
by Shanti S. Gupta, and William J. Studden. Oct 65, 21p. Rept. no. mimeograph series no. 58
Contract Nonr1100 26 ,AF33 657 11737
Unclassified report

See also AD-618 524.

Descriptors: (*Decision theory, Population (Mathematics)), (*Statistical analysis, Population (Mathematics)), Selection, Probability, S-matrix, Theory, Vector analysis, Set theory

A problem of subset selection for parameters which are not necessarily scale or location parameters is considered. A general theorem dealing with the infimum of the probability of a correct selection for parameters occurring in densities which are Poisson mixtures of arbitrary densities on the interval (0, infinity) is proved. This theorem is applied to obtain the minimum value of the probability of a correct selection in several cases where multivariate normal populations are ranked according to a given scalar quantity.

AD-623 274 Div. 15/1 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
ABELIAN GROUPS OF HYPERSURFACES,
by Dominic G. B. Edelen. Oct 65, 68p. Rept. no. RM-4445-PR
Contract AF49 638 700
Unclassified report

Rept. on Ptoj. RAND.

Descriptors: (*Groups (Mathematics), Differential geometry), (*Differential geometry, Groups (Mathematics)), Vector analysis, Transformations (Mathematics), Functional analysis, Physics

Results are presented of the study of Abelian groups of hypersurfaces (i.e., hypersurfaces that form the cross sections of a one parameter group of point transformations in an n-dimensional metric space). Part one obtains the basic defining differential equations of the Abelian group of hypersurfaces; part two examines critical points in the enveloping n-dimensional space that belong to two or more distinct hypersurfaces of the group; and part three obtains the images of the first and second fundamental forms and the field of normal vectors of a given hypersurface when it is imbedded in an Abelian group of hypersurfaces. (Author)

AD-623 281 Div. 15/1 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE FITTING OF DATA BY LEAST SQUARES TO NON-LINEARLY PARAMETERIZED FUNCTIONS,
by R. J. Calsen. Oct 65, 19p. Rept. no. P-3252
Unclassified report

Descriptors: (*Least squares method, Functions), Iterative methods, Chemical equilibrium, Data

An iterative method is described for fitting data to a general non-linearly parameterized function, and details the numerical procedure for fitting data to determine certain constants arising from a chemical equilibrium problem. Procedures similar to the method described have been used by many authors to solve various function-fitting problems. (Author)

AD-623 310 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
ON THE KUNH-TUCKER THEOREM,
by Jean Abadie. Jun 65, 27p. Rept. no. ORC-65-18
Contract DA31 124ARO D331 ,Nonr22283
Proj. DA20014501B14C
AROD , 5307:4
Unclassified report

See also AD-619 768.

Descriptors: (*Theorems, Mathematical programming), (*Linear programming, Theory), Optimization

The general programming problem considered has the form: minimize f (x) subject to (1) g sub i (x) = o, i = 1,2,..., m. The regularity condition of Cottle is first generalized so that any linear system satisfies a (new) regularity condition. It is then proven that this regularity condition is actually a sufficient criterion for a certain weakened form of the Kuhn-Tucker constraint qualification property. Finally, a further generalization of the latter property is given. (Author)

AD-623 333 Div. 15/1 ,30/2
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
ON THE DUAL-MONOTONICITY OF THRESHOLD FUNCTIONS.
Revised ed.,
by Ming-Tsan Liu. 4 Feb 65, 3p. Contract DA31 124ARO D97
AROD , 3653:4M

Unclassified report

Pub. in IEEE Transactions on Electronic Computers p625-7 Aug 65 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 19 Aug 64.

Descriptors: (*Special functions (Mathematical), Switching circuits), Mapping (Transformations), Set theory, Algebra, Computer logic

A chain of necessary conditions is established for threshold functions. These conditions are called dualcomparability, 1-dual monotonicity, 2-dual-monotonicity, etc., and their union, complete dual-monotonicity. The relationship between monotonicity and dualmonotonicity is explored.

AD-623 366 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
SYMPOSIUM ON FUNCTION ALGEBRAS, APRIL 19-24 1965.
Final rept.
Oct 65, 10p. Rept. no. mimeograph Series-1
Contract NSF GP3438 ,Nonr G00061 65 Proj. RR00301 ,NR043 326

Unclassified report

Descriptors: (*Algebras, Functions), Harmonic analysis, Functional analysis, Complex variables, Symposia

Activities are summarized of the symposium on function algebras held at Tulane University in April 1965. Topics discussed, and papers submitted for publication at the symposium are listed.

AD-623 405 Div. 15/1 ,9/1
CFSTI Prices: HC $3.00 MF $0.75
NORAIR DIV NORTHROP CORP HAWTHORNE CALIF
A METHOD OF CHARACTERISTICS SOLUTION IN THREE INDEPENDENT VARIABLES.
Final rept. for May 65,
by B. N. Pridmore Brown, and W. J. Franks. Jun 65, 76p. Rept. no. nor-65-42
Contract AF33 657 7326 Proj. 7071 Task 707103 ,70437
ARL , 65-124

Unclassified report

Descriptors: (*Partial differential equations, Numerical methods and procedures), (*Numerical methods and procedures, Partial differential equations), (*Supersonic flow, Numerical analysis), Perturbation theory

An improved method for the solution of hyperbolic partial differential equations in three independent variables is presented, with application to supersonic steady flow of an inviscid ideal gas. A finite difference method of characteristics is used. New approaches which improve accuracy and efficiency in a three dimensional numerical solution are discussed for solving the shock singularities, for controlling finite difference meshes in three dimensional space so that stability conditions are satisfied, and for interpolation. A major departure from previous approaches to this problem is the choice of local coordinates and base point configurations with reference to directions of maximum variation of the dependent variables on the initial value surface. While this condition is automatically satisfied in methods of characteristics solutions in two independent variables it has apparently been ignored in previous approaches to the problem in three variables. It is of sufficient importance to make the difference between meaningless and accurate results. Results illustrating the behavior of the numerical solutions are presented. (Author)

AD-623 459 Div. 15/1 ,15/2
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
MEASURABLE GAMBLING HOUSES,
by Ralph E. Strauch. Nov 65, 19p. Rept. no. P-3260

Unclassified report

Descriptors: (*Game theory, Measure theory), (*Measure theory, Game theory), Functional analysis, Probability, Dynamic programming

It is shown in this paper that given a Borel measurability structure of the type used by Blackwell in dynamic programming, the utility of the house, while not necessarily Borel measurable, is absolutely measurable and hence its integral is defined with respect to any Borel measure. (A function is absolutely measurable if it is measurable with respect to the completion of the Borel sets under any measure.) Moreover, the gambler can do as well using only measurable policies (defined below) as he can using arbitrary policies.

AD-623 465 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
AN EXTENSION OF GENERALIZED UPPER BOUNDED TECHNIQUES FOR LINEAR PROGRAMMING.
Research rept.,
by R. N. Kaul. Aug 65, 33p. Rept. no. ORC-65-27
Contract DA31 124ARO D331 ,Nonr22283 Proj. NR047 033
AROD , 5307.5

Unclassified report

See also AD-610 950, AD-614 577.

Descriptors: (*Linear programming, Optimization), Combinatorial analysis, Theorems, Matrix algebra, Operations research, Iterative methods

The paper by Dantzig and Wolfe (Decomposition Principle for Linear Programs) suggested the need for developing new techniques for solving linear programming problems with a special matrix structure. A number of techniques have appeared since then. In this report, an algorithm for solving a structured linear programming problem with a very large number of blocks is given. The main feature of the method as described in another work (Generalized Upper Bounding Techniques for Linear Programming, II) is to carry out the computation with the help of a smaller basis whose order is equal to the number of linking equations coupling together the various blocks. (Author)

AD-623 536 Div. 15/1
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF MATHEMATICS
A CATEGORY THEOREM IN THE ERGODIC THEORY. (UN THEOREME DE CATEGORIE DANS LA THEORIE ERGODIQUE),
by Alexandra Ionescu Tulcea. 1963, 3p. Contract DA31 124AROD G218

Unclassified report

Pub. in Academie des Sciences, Paris. Comptes Rendus (France) v257 n18 p18-20 Jul 1 1963 (Copies available only to DDC users).

Descriptors: (*Measure theory, Set theory), (*Set theory, Measure theory), Functional analysis, Groups (Mathematics), Topology, Algebra

AD-623 561 Div. 15/1
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
CHANGES OF TOPOLOGY AND FIXED POINTS FOR MULTI-VALUED FUNCTIONS.
Technical publication,
by R. E. Smithson. 22 Nov 63, 12p. Rept. no. NOTS-TP-3942
NAVWEPS , 8977

Unclassified report

Pub. in the Proceedings of the American Mathematical Society v16 n3 p448-54 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Topology, Functional analysis), (*Functional analysis, Topology), Set theory, Theorems

Let F be a continuous finite-valued function on X into X (F is finite-valued in case F (x) is a finite subset of X for each x that is a member of X). If X is Hausdorff, acyclic and either metric or has arbitrarily small open sets with arcwise connected components, then F is continuous when X has the topology generated by the arcwise connected components of open sets. Using this lemma we can prove: If X satisfies the above conditions, if X is arcwise connected, and if each nest of arcs is contained in an arc, then X has the fixed point property for finite-valued functions. (Author)

AD-623 616 Div. 15/2 ,8/7
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
ON THE STRUCTURE AND THE HAUSDORFF DIMENSION OF THE SUPPORT OF A CLASS OF DISTRIBUTION FUNCTIONS INDUCED BY ERGODIC SEQUENCES,
by Harry Dym. Oct 65, 21p. Rept. no. TM-04155
Contract AF19 628 5165 Proj. 508G
ESD , TR-65-130

Unclassified report

Descriptors: (*Statistical functions, Stochastic processes), (*Measure theory, Sequences), (*Communication theory, Statistical functions), Probability

AD-623 642 Div. 15/1 ,25/6 ,2/1
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HERALD OF LENINGRAD UNIVERSITY, NO. 13, MATHEMATICS, MECHANICS, AND ASTRONOMY SERIES, ISSUE 3, 1963.
13 Apr 65, 237p. Rept. no. FTD-MT-64-249
TT , 65-64497

Unclassified report

Edited machine trans. of Leningrad Univ. Vestnik (USSR) v18 n13 Seriya Matematiki, Mekhaniki i Astronomii n3 p1-152 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Mathematics, Reports), (*Mechanics, Reports), (*Astrophysics, Reports), Functions, Complex variables, Surfaces, Algebra, Differential equations, Aerodynamic characteristics, Kinetic theory, Blade airfoils, Turbine blades, Circuits, Solar radiation, Stars, Spectroscopy, USSR

Contents: Conditions of uniqueness and estimations of the solution of Dirichlet's problem; Approximation of a function with a stochastic argu-

ment; Propagation of complex functions; Asymptotic formulas for coefficients of exchange by momentum and energy on the surface of a body around which rarefied gas is flowing; Relaxation processes in gases with internal degrees of freedom; Supporting screw surface; Radiation diffusion in a semi-infinite medium during anisotropic scattering; Self-alignment and balancing of coaxial rotors; Surfaces whose plane sections are composed of convex parts; Increase in norm L sub p and Orlich spaces; Algebraic approximations in power series; Reliability of single-cycle circuits built from elements with 'Symmetric' errors; Embedding in the case of cyclical normal divisor of order 2 to the nth power; Base pressure for solids of revolution in a supersonic gas flow; Nonlinear system of two differential equations; Intensities of emission lines N III in stellar spectra; Spectral pattern N III used for calculation of recombination spectrum in shells of stars and nebulae; Proof of hypotheses in multidimensional analysis.

AD-623 666 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
CLASSICAL TRANSFORMS OF MEASURES AND L (1) FUNCTIONS,
by John J. Benedetto. Oct 65, 15p. Rept. no. BN-417
Contract Nonr59517
Unclassified report

Descriptors: (*Integral transforms, Measure theory), (*Measure theory, Integral transforms), (*Functional analysis, Integral transforms), Distribution theory, Topology, Functions

AD-623 675 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
MINIMIZING FUNCTIONALS ON NORMED-LINEAR SPACES,
by A. A. Goldstein. Aug 65, 18p. Rept. no. MN-419 ,D1-82-0459
Contract AF AFOSR937 65
Unclassified report

Descriptors: (*Functions, Optimization), (*Algebraic topology, Functions), Control, Rendezvous trajectories, Simultaneous equations

Steepest descent and related topics are discussed. An example is given taken from a simple rendezvous problem in control theory. The problem is one of minimizing a norm on an affine subspace. The problem here is solved in the primal. (Author)

AD-623 696 Div. 15/2
CFSTI Prices: HC $2.00 MF $0.50
WISCONSIN UNIV MADISON DEPT OF STATISTICS
USE OF TRANSFORMATIONS ON PARAMETERS IN NON-LINEAR THEORY. II. MEASURES OF NONLINEARITY AND TRANSFORMATIONS TO REDUCE NON-LINEARITY;
by Irwin Guttman, and Duane A. Meeter. Jul 64, 44p. Rept. no. TR-38
Contract Nonr120217
Unclassified report

Descriptors: (*Measure theory, Transformations (Mathematics)), (*Transformations (Mathematics), Measure theory), Nonlinear systems, Least squares method, Probability, Mathematical models

Non-linear least squares problems, and measures of non-linearity are discussed. Some measures of nonlinearity due to Beale (1960 are introduced), and the behavior of these measures is examined using certain specific examples. The effect of using transformations of parameters to reduce the nonlinearity measures is investigated.

AD-623 697 Div. 15/2
CFSTI Prices: HC $2.00 MF $0.50
WISCONSIN UNIV MADISON DEPT OF STATISTICS
USE OF TRANSFORMATION ON PARAMETERS IN NON-LINEAR THEORY. I. TRANSFORMATIONS TO ACCELERATE CONVERGENCE IN NON-LINEAR LEAST SQUARES.
Technical rept.,
by Irwin Guttman, and Duane A. Meeter. Jul 64, 35p. Rept. no. TR-37
Contract Nonr120217 Proj. NR042 222
Unclassified report

Descriptors: (*Least squares method, Transformations (Mathematics)), (*Transformations (Mathematics), Least squares method), Nonlinear systems, Iterative methods, Taylor's series, Mathematical models

The use of transformations of parameters of nonlinear models to facilitate their estimation is discussed. Transformations are considered which are designed to accelerate convergence in calculating least squares estimates.

AD-623 698 Div. 15/1 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
WISCONSIN UNIV MADISON DEPT OF STATISTICS
A SIMPLE SYSTEM OF EVOLUTIONARY OPERATION SUBJECT TO EMPIRICAL FEEDBACK.
Technical rept.,
by George E. P. Box. Oct 64, 15p. Rept. no. TR-40
Contract Nonr120217 Proj. NR042 222
Unclassified report

Descriptors: (*Scientific research, Mathematical models), (*Optimization, Feedback), Control, Game theory, Decision theory, Operation, Experimental data

Experimentation can lead to progress through empirical feedback or through scientific (technical) feedback; or more usually by some combination of both. Empirical feedback is typical of the 'try it and see' or Edisonian approach. Here information fed back from the experiment triggers a simple reaction like 'except a modification which increases yield.' By contrast scientific feedback occurs as an interaction between the data and the knowledge, experience, and imagination of the experimenter. It may result in reactions to data which are quite unpredictable by consideration of the data alone. An example would be the decision to vary in further experimentation certain specific factors not even considered in the previous stages of the work. An empirical feedback mode! for an elementary form of evolutionary operation is considered. From this investigation it is clear that the strategy necessary to achieve optimal empirical feedback might give very poor scientific feedback and vice versa. Because scientific feedback plays perhaps the most important part in most successful uses of evolutionary operation it would be inefficient in practice to adopt the optimal empirical feedback strategy. (Author)

AD-623 699 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
WISCONSIN UNIV MADISON DEPT OF STATISTICS
UNEQUAL GROUP VARIANCES IN THE FIXED EFFECTS ONE-WAY ANALYSIS OF VARIANCE: A BAYESIAN SIDELIGHT.
Technical rept.,
by Norman R. Draper, and Irwin Guttman. Oct 64, 17p. Rept. no. TR-41
Contract Nonr120217 Proj. NR042 222
Unclassified report

Descriptors: (*Analysis of variance, Inequalities), Probability, Distribution theory, Groups (Mathematics), Sampling

The effect of inequality of variance on the standard F-tests for one-way and two-way analysis of variance classification has been examined previously. Certain results found by Box for the one-way classification are examined. A Bayesian analysis is shown to throw light on the consequences of Box's work in a given experimental situation.

AD-623 091 See Fld. 15/7

AD-623 145 See Fld. 9/3

AD-623 173 See Fld. 5/10

AD-623 200 See Fld. 6/16

AD-623 209 See Fld. 9/2

AD-623 393 See Fld. 5/9

AD-623 394 See Fld. 5/3

AD-623 398 See Fld. 20/13

AD-623 488 See Fld. 20/3

AD-623 503 See Fld. 13/8

AD-623 518 See Fld. 5/1

AD-623 519 See Fld. 5/1

AD-623 528 See Fld. 20/12

13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-623 161 Div. 13/1 ,27/2
CFSTI Prices: HC $2.00 MF $0.50
TECH DEVELOPMENT INC DAYTON OHIO
THE DEVELOPMENT OF GAS AND LIQUID CIRCULATING DEVICES FOR MANNED SPACE ENCLOSURES.
Final rept. for Feb 64-Feb 65,
by Joseph Flatt. Aug 65, 33p. Contract AF33 615 1251 Proj. 6373 Task 637302
AMRL , TR-65-128
Unclassified report

Descriptors: (*Oxygen equipment, Pumps), (*Coolant pumps, Spaceborne), (*Life support, Closed ecological systems), (*Closed ecological systems, Life support), (*Gas turbines, Life support), Respiration, Feasibility studies, Pressure, Tests, Design, Controlled atmospheres, Blowers, Energy

An analytical and experimental investigation was conducted to determine the feasibility of utilizing the energy available in breathing oxygen, when expanded from storage pressure to breathing pressure, to power two types of pumping devices; (1) an oxygen-circulating blower, and (2) a water-circulating pump. With an oxygen weight flow of 2.65 lb/hr and an ambient environmental pressure of 5 psia, the required performance of 5 cfm at 10 inches H2O static pressure for the circulating blower and 1 lb/min at a back pressure of 10 inches H2O for the water pump were met. Performance considerably in excess of the requirement was obtained for the water pump. Both units were powered by single-stage impulse turbines and weighed

less than the 1-pound requirement. Both units operated reliably without mechanical malfunction and appear to be suited for manned aerospace enclosures. (Author)

AD-623 387 See Fld. 14/2

13/2. CIVIL ENGINEERING

AD-623 618 Div. 13/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
REQUIREMENTS FOR LIQUID DISTRIBUTION SYSTEMS IN POLAR CAMPS.
Technical note,
by C. R. Hoffman. Oct 65, 16p. Rept. no. TN-N-724
Proj. Y F015 11 01 195
Unclassified report

Descriptors: (*Polar regions, Life support), (*Liquids, Distribution), (*Pipes, Thermal insulation), Water supplies, Freezing, Copper, Iron, Plastics, Polyvinyl chloride, Fuels, Thermal radiation, Standards, Sewage

The distribution of freezable liquids in polar camps poses special problems seldom encountered in domestic piping systems. Preliminary cold chamber tests were conducted to obtain basic freezing rate information on water flowing through test loops of 2-inch galvanized steel, PVC plastic pipe and Type K copper tubing. It was found that heat is lost more slowly from plastic and copper pipes than from steel pipe. Also, at high fluid velocities, significant amounts of heat are generated which effectively reduce the air temperature at which freezing occurs. (Author)

AD-623 237 See Fld. 16

AD-623 466 See Fld. 13/13

13/4. CONTAINERS AND PACKAGING

AD-623 300 Div. 26/7 ,14/8 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
TRANSPARENT FLEXIBLE HEAT SEALABLE FILMS EVALUATION OF ABILITY TO PROTECT AGAINST CORROSION.
Technical rept.,
by Richard Murrens. Jun 65, 21p. Rept. no. ria-65-1588
Proj. DA 1C024401A110
Unclassified report

Descriptors: (*Films, Plastics), (*Plastics, Films), (*Corrosion inhibition, Films), (*Steel, Corrosion inhibition), Packaging, Panels (Structural), Moistureproofing, Water vapor, Effectiveness, Environmental tests

Ten different transparent plastic films were evaluated for their ability to provide protection against corrosion to steel panels with and without preservation in an accelerated humidity environment. The films represented water vapor transmission rate (WVTR) values currently required by military specifications. Results showed that films with low WVTR values did not prevent the entrance of water vapor, which resulted in corrosion. Prevention against corrosion was maintained for extended periods of time only when preservatives were used. (Author)

AD-623 454 See Fld. 19/1

13/6. GROUND TRANSPORTATION EQUIPMENT

AD-623 237 See Fld. 16

13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

AD-623 118 Div. 26/8 ,9/1
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
FLOW-THROUGH ELEMENTS OF PNEUMATIC MONITORING AND CONTROL DEVICES,
by L. A. Zalmanzon. 14 Sep 65, 380p. Rept. no. FTD-TT-65-168
TT , 65-64344
Unclassified report

Unedited rough draft trans. of mono. Protichnye Elementi Pnevmaticheskikh Priborov Kontrolya i Upravleniya, Moscow, 1961 248p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Pneumatic devices, Fluid flow), Monitors, Control systems, USSR, Pneumatic systems, Instrumentation, Mathematical analysis, Gas flow

Contents: Theory of throttles; Pneumatic chambers, their static characteristics; Dynamics of pneumatic chambers; Characteristics of long pneumatic lines, pneumatic tubes as systems with distributed parameters.

AD-623 190 Div. 26/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A DISTRIBUTING DEVICE,
by Ya. V. Epshtein. 7 Oct 65, 8p. Rept. no. FTD-TT-65-1133
TT , 65-64422
Unclassified report

Unedited rough draft trans. of Russian patent 167 103, appl. no. 744145/25-8, 8 Sep 61, 3p.

Descriptors: (*Hydraulic systems, Distributors), (*Distributors, Hydraulic systems), Pumps, Patents, Design, USSR, Separation, Pipes

This distributing device, designed for distributing the working fluid from one pump to hydraulic chambers, is different in that, to distribute the working fluid from one pump to any given number of hydraulic chambers, the distributing device contains separate, interconnected distributors; the main pressure lines of the distributors and also their main drain lines are connected in parallel by tubing, and the valves of the distributors are consecutively connected by the common channel of the by-pass valve control. (Author)

AD-623 389 Div. 26/8 ,28/3
CFSTI Prices: HC $3.00 MF $0.75
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
PRELIMINARY DESIGN FOR THE SHOULDERS AND ARMS OF A POWERED EXOSKELETAL STRUCTURE.
Final technical rept.,
by Neil J. Mizen. 15 Jun 65, 73p. Rept. no. cal-VO-1692-V-4
Contract Nonr383000
Unclassified report

Descriptors: (*Musculoskeletal system, Amplifiers), (*Hydraulic servomechanisms, Musculoskeletal system), Human engineering, Arms, Joints (Physiology), Humans, Hoists, Loading (Mechanics), Stresses, Strength, Power, Performance (Human), Motor reactions, Actuators

A preliminary design of a portion of a powered exoskeletal device (termed the Man Amplifier) is presented. This portion consists of the fourteen joints (seven for each shoulder and arm) comprising the arm and shoulder structure. The hands are not included. The preliminary design is based upon the requirement that each arm be able to support and manipulate 1000 lbs in any position. The stresses within the structure are computed for various positions of the joints. Rotary actuators are described that satisfy the load requirement with a pressure drop of 2000 psi across them. A technique for sensing limb positions of the wearer is presented. Desirable characteristics of the servo valve are given, and one particular servo configuration is analyzed. The analysis is used to select approximate values for the valve parameters. It is concluded that the size of the actuators is the significant physical property effecting mobility. Further, it is concluded that the selected load rating be reduced for future designs. (Author)

13/8. INDUSTRIAL PROCESSES

AD-623 301 Div. 26/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF MICHELSON LABS
A CRITICAL LOOK AT ULTRASONIC WELDING.
Technical article,
by Thomas H. Hazlett. Oct 65, 13p.
NOTS , TP-3518
Unclassified report

Descriptors: (*Welding, Ultrasonic radiation), (*Ultrasonic radiation, Welding), Welds, Bonding, Effectiveness

This technical article reviews the state of the art of ultrasonic welding and discusses some of the advantages and disadvantages of the process. It examines several theories of the nature of the bond; factors affecting the strength of the bond; and the mechanisms and applications of the process. It concludes that although ultrasonic welding appears to be an attractive process, fundamental and applied research is necessary before it will find its special place in the field of joining similar and dissimilar metals. (Author)

AD-623 503 Div. 26/4 ,15/2
COLUMBIA UNIV NEW YORK
QUALITY CONTROL CHARTS UTILIZING STATISTICAL ANALYSIS (CARTES DE CONTROLE A DOUBLE LIMITES ET A SEQUENCES,
by J. Tiago de Oliveira, and Sebastian B. Littauer. 1965, 14p. Contract Nonr26604
Unclassified report

Text in French; pub. in Revue de Statistique Appliquee (France) v13 n2 p61-73 1965 (Copies available only to DDC users).

Descriptors: (*Quality control, Statistical analysis), (*Statistical analysis, Quality control), Industrial production, Acceptability, France

AD-623 568 Div. 26/4 ,22/1 ,20/8
CFSTI Prices: HC $1.00 MF $0.50
WATERTOWN ARSENAL LABS MASS
TECHNICAL AND PRACTICAL CONSIDERATIONS OF AMMUNITION INSPECTION WITH ISOTOPE RADIOGRAPHY.
Technical rept.,
by Ernest H. Rodgers. Mar 58, 20p. Rept. no. WAL-TR-142-66
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ammunition, Radiography), (*Radioactive isotopes, Radiography), (*Radiography, Radioactive isotopes), (*Nuclear industrial applications, Radiography), Ordnance, Quality control, Nondestructive testing, Feasibility studies

This study was undertaken to determine the technical feasibility of utilizing radio-isotopes for radiography of ammunition both in current production and under emergency conditions. At the present time there appears to be no general answer as to whether the radio-isotope technique will prove feasible for the solution of a particular type of problem. Each must be analyzed individually with extreme care and precise techniques. Under current production levels the use of radio-isotopes for radiographic inspection of ammunition should not be considered. This statement is made because of the fact that there are, currently, many and varied types of X-ray machines available and in operation within the Ordnance Corps as well as in private industry. Utilizing conventional X-ray machines, industrial radiography of ammunition can be accomplished speedily, economically, and safely while acquiring the desired inspection quality. The thickness level, in the case of ammunition inspection, is not prohibitive of isotope radiography, but the necessary quality levels and the shapes of the components are not considered conducive to acceptable inspection results. Under emergency conditions isotope radiography of ammunition could be accomplished speedily, economically, and with safety. The most important factor, that of inspection quality, was intentionally omitted because it is felt that the acceptable quality levels would have to be revised and standards lowered, under emergency conditions, if isotope radiography were to be employed. (Author)

AD-623 588 Div. 26/1 ,17/4 CFSTI PricesMF $0.75
AIR FORCE MACHINABILITY DATA CENTER CINCINNATI OHIO
MACHINING DATA FOR TITANIUM ALLOYS,
by John Maranchik Jr.. 1 Aug 65, 63p. Rept. no. AFMDC-65-1

Unclassified report

Hard copy available from AFM Data Center, Cincinnati, Ohio, 45209. Operated for AF under contract AF33 615 2161 by Metcut Research Associates.

Descriptors: (*Titanium alloys, Machining), (*Machining, Titanium alloys), Materials removal, Cutting fluids, Cutting tools, Chlorine

The objective of this pamphlet is to update the machining technology of titanium alloys. It provides starting machining recommendations for all current Commercially-Pure, Alpha, Alpha-Beta, and Beta titanium alloys for the following machining operations: turning, face milling, end milling-slotting, end millingperipheral, drilling, reaming, tapping, broaching, and surface grinding. Tool drawings indicating tool nomenclature, as well as a grinding wheel chart, are included. The designation of alloys in the various machining charts is limited to one system, but an appendix provides a cross reference of alloy designations used by various producers and others. An appendix is also included which provides comments relating to the use of chlorine containing cutting fields. (Author)

AD-623 107 **See Fld. 9/1**

AD-623 143 **See Fld. 21/8**

AD-623 265 **See Fld. 9/1**

AD-623 284 **See Fld. 9/1**

AD-623 320 **See Fld. 9/1**

AD-623 395 **See Fld. 9/1**

AD-623 518 **See Fld. 5/1**

AD-623 600 **See Fld. 11/6**

13/9. MACHINERY AND TOOLS

AD-623 210 Div. 26/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CENTRIFUGAL SEALING OF A ROTATING SHAFT,
by M. A. Razran, and B. S. Troyanker. 7 Oct 65, 6p. Rept. no. FTD-TT-65-1131 TT , 65-64428

Unclassified report

Unedited rough draft trans. of Russian patent 165 624, appl. no. 846604/25-8, 9 Jul 63, 2p.

Descriptors: (*Rotary seals, Shafts), Centrifugal fields, Patents, USSR, Disks, Seals (Stoppers), Centrifugal pumps

The object of the invention is the centrifugal sealing of a rotating shaft, for instance, of a centrifugal pump. To prevent overflow of the medium along the rotating shaft and to create self-sealing, elastic disks with edges bent in the direction of the medium of increased pressure are installed in the immobile sleeve fastened in the housing of the pump which are placed between the hard washers and fastened onto the rotating shaft. (Author)

AD-623 665 Div. 26/6 ,25/6
CFSTI Prices: HC $4.00 MF $0.75
SKF INDUSTRIES INC KING OF PRUSSIA PA RESEARCH LAB
BASIC STUDY OF THE SLIDING CONTACTS IN ROLLING BEARINGS.
Progress rept. no. 2, Proj. 2, 17 Jul-16 Oct 65, by C. J. Belsky, J. A. Kamenshine, J. I. McCool, W. E. Schmidt, and K. Tataiah. 16 Oct 65, 128p. Rept. no. AL65L081
Contract NOw65 0182f Proj. SKF18 7 ,19 1

Unclassified report

See also AD-619 276.

Descriptors: (*Roller bearing, Mechanics), (*Friction, Roller bearings), Loading (Mechanics), Velocity, Lubricants, Surface properties, Cylindrical bodies, Motion, Tests, Statistical analysis, Data, Mineral oils

A 2-ball test machine, especially designed for sliding tests and capable of being used with irradiated balls for purposes of wear determination, was used to determine the load-speed relationship at the initiation of smearing failure in a sliding 2-ball configuration for three highly refined mineral oils and three ester-type lubricants. A configuration of three crowned cylindrical rollers was operated between two flat thrust washers in the presence of a non-metallic cage. The elastohydrodynamic film condition between rollers and flat washers was determined using a previously developed contact conductivity method. Preliminary surface microgeometry tracings were made on the test elements and the required modification of statistical theories relating conductivity results to the film thickness/roughness ratio was accomplished. Kinematical studies were made of the axial roller motion and skew of cylindrical rollers running in a conventional cylindrical roller bearing with flanged outer ring, in aligned or misaligned conditions.

AD-623 336 **See Fld. 22**

AD-623 400 **See Fld. 13/10**

13/10. MARINE ENGINEERING

AD-623 131 Div. 31/5 ,33/4
CFSTI Prices: HC $4.00 MF $1.00
OHIO RIVER DIV LABS CINCINNATI
RESISTANCE OF BARGE TOWS; MODEL AND PROTOTYPE INVESTIGATIONS; CIVIL WORKS INVESTIGATIONS 814 AND 835,
by A. J. Moors. Aug 60, 134p.

Unclassified report

Descriptors: (*Barges, Drag), (*Inland waterways, Configuration), Model tests, Performance (Engineering), Hydraulic models, Graphics

Model tests were conducted at 1:36 scale ratios in restricted, shoal, and nonrestricted straight channels to investigate channel effects on resistance of barge tows. The restricted channel widths varied from 125 to 300 ft with 1-on-2 side slopes, the shoal channels were 540 ft wide with vertical slopes; depths in both channels varied from 6.5 to 30 ft. The nonrestricted channels were 792 ft wide by 342 ft deep. Seven different sizes and shapes of barges were tested in flotillas of one to eight similar barges loaded to the same draft. Some of the tests simulated field tests. Comparisons of model and prototype data indicate speeds predicted from model tests conformed generally with those observed in field tests. Relations were developed for shoal and restricted channels to indicate relative effects of channel dimensions on flotilla performance. An equation was developed to evaluate flotilla performance in deep water. (Author)

AD-623 132 Div. 31/5 ,33/4
CFSTI Prices: HC $5.00 MF $1.00
OHIO RIVER DIV LABS CINCINNATI
RESISTANCE OF BARGE TOWS: MODEL AND PROTOTYPE INVESTIGATIONS: CIVIL WORKS INVESTIGATIONS 814 AND 835; SUPPLEMENT,
by L. A. Baier. Jun 63, 182p.

Unclassified report

Descriptors: (*Barges, Drag), (*Inland waterways, Configuration), Model tests, Performance (Engineering), Hydraulic models, Graphics

For convenience the basic data is presented in tabular form with added pertinent factors. A critical review of two formulae were incorporated and additional parameters investigated. Resistance data covering eight single barges and two large flotillas were added, all in deep water. AD623 131 contains information covering the details of tank arrangement; test procedures; model-prototype comparisons; symbols; references; and other facts of material interest. Additional symbols and references are added.

AD-623 352 Div. 31/5 ,2/9
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
THE CONCEPT OF PORTABILITY APPLIED TO FUTURE OCEANOGRAPHIC SHIP OPERATION,
by Maxwell Silverman, and Roy D. Gaul. 1965, 15p. Contract Nonr221623 Proj. NR083 005

Unclassified report

Pub. in Ocean Science and Ocean Engineering p384-97 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Texas A and M Univ., College Station. Dept. of Oceanography and Meteorology.

Descriptors: (*Oceanographic vessels, Economics), (*Oceanographic equipment, Portable), Costs, Design, Packaging

Rising research vessel costs due in part to the explosive expansion of the oceanographic fleet are examined in relation to the increasing demand for more flexibility and economy in scientific opera-

tions. A technique of coupling basic general purpose ships to special purpose scientific appurtenances is suggested as a possible means of achieving greater research utility at lower cost than can be realized with 'built-in' vessels. Portability appears to hold the greatest immediate promise for medium size vessels that properly should account for the bulk of research operations. Comparisons are drawn between current vessel applications and use of the portability concept. (Author)

AD-623 400 Div. 31/3 ,26/6
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA RESEARCH AND DEVELOPMENT CENTER
CONSTANT RELATIONSHIP HOIST DRIVE SYSTEM.
Final rept. for Jan 58-Mar 65,
by Richard L. Meyer. Mar 65, 57p. Rept. no. WG-82137
Contract NBy53151
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Hoists, Variable speed drives), (*Variable speed drives, Hoists), (*Handling, Hoists), Motion, Shipborne, Feedback, Control systems

The report covers the development and performance of the prototype Constant Relationship Hoist drive system built for test and evaluation for the U. S. Navy Bureau of Yards and Docks. This hoist system compensates for relative motion to give the operator control of the load. This is accomplished by feeding back into the regulator the relative motion of the unloading and loading stations and applying this signal into the drive system control to compensate the load for this relative motion. (Author)

AD-623 551 Div. 31/5
CFSTI Prices: HC $2.00 MF $0.50
WEBB INST OF NAVAL ARCHITECTURE GLEN COVE N Y
WAVE RESISTANCE SURVEYS ON A SHIP MODEL OF MINIMUM RESISTANCE.
Technical rept.,
by Lawrence W. Ward. Aug 65, 27p. Contract Nonr415200 Proj. S R009 01 01
Unclassified report

Descriptors: (*Ship models, Stability), (*Water waves, Force (Mechanics)), Fluid dynamic properties, Drag, Model tests

Wave survey tests, according to the 'XY' method, were carried out in the Webb Towing Tank on an optimum ship form model. This method utilizes measurements of the force due to the waves impinging on a long vertical cylinder to deduce the wave resistance directly from the model wave pattern. The form tested was one of a series optimized by computer at the University of California with respect to total drag, assuming equivalent flat plate friction and the linearized (Michell) theory of wave resistance, at a certain design Froude number. The experimental results show the wave resistance to be small in the vicinity of the design Froude number and demonstrate a decided advantage of such direct wave survey methods over the classical Froude method of determining the wave resistance in such cases. (Author)

13/12. SAFETY ENGINEERING

AD-623 295 Div. 13/11
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
THE MEASUREMENT OF PARTICLE SIZE OF FIRE FIGHTING DRY CHEMICALS.
Interim rept.,
by H. B. Peterson. 27 Sep 65, 20p. Rept. no. NRL-6274
Proj. SEQ621 001 652F012 05 04
Unclassified report

Descriptors: (*Fire extinguishers, Powders), (*Particle size, Chemicals), Potassium compounds, Bicarbonates, Physical properties

Four samples of potassium bicarbonate base fire extinguishing powders, 'Purple-K-Powder,' which had been ground to different degrees of fineness were analyzed for particle size characteristics by several different methods. These were the Blaine Fineness test, the Roller Particle Analyzer, the Coulter Counter, surface area by nitrogen adsorption, and mercury porosity. Comparisons were made of the results of the procedures. Highest values for specific surface were obtained by the nitrogen adsorption method followed by the Blaine, the Coulter, and then the Roller Methods, in that order. No conclusions were made as to which method gave the most accurate result for particle size, but it was found that the mean diameter was a better basis for comparing results than was the median diameter. Although the relationships of specific surface values among methods were non-linear over wide ranges, face values among methods were nonlinear over wide ranges, calibration curves were made to facilitate conversion. It was also concluded that specific surface values, as obtained by permeability with the Blaine method, were adequate for describing the desired size of particles for fire extinguishing purposes. (Author)

AD-623 296 **See Fld. 1/2**

13/13. STRUCTURAL ENGINEERING

AD-623 103 Div. 13/4
CFSTI Prices: HC $2.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO STRUCTURAL AND ARCHITECTURAL BRANCH
PRECAST CONCRETE FORMS FOR REINFORCED CONCRETE STRUCTURES,
by William H. Wolf, and Arthur J. Power. Oct 65, 47p. Rept. no. SA-4
Unclassified report

Descriptors: (*Molding, Concrete), (*Concrete, Molding), (*Reinforced concrete, Structures), Reinforcing materials, Structural parts, Structural properties, Economics, Design, Joints, Loading (Mechanics), Structures

In the USSR precast concrete integrated formwork has proven more economical than conventional types of removable forms, but in the US under different economic and geographic conditions they can be used to economic advantage only where their full potentialities can be realized. Advantages shown by a study of literature on their design, manufacture, and use are: (1) Precast concrete forms can be denser, more resistant to erosion and corrosion, less permeable, stronger, and of more uniform quality than cast-in-place concrete, thereby improving concrete surfaces subject to wetting and weather and permitting a reduction of quality and cost of interior concrete. (2) Elimination of form removal and patching of form anchor holes and surface defects reduces cost. (3) Under freezing conditions cast-inplace concrete is protected by the forms and curing of concrete surfaces is eliminated. (4) Construction joints are offset from form joints, stopping leakage and precluding need for waterstops. (5) Bottom faces of slabs and beams can be formed with precast beam elements, reducing support scaffolding and cost. Disadvantages include increased thickness of a member, special forms needed for blockouts and openings, storage area needed for the precast units, difficulties in handling and erecting, and possible voids behind facing slabs. These and other factors of design, anchor systems, joints, and bonding should be studied. (Author)

AD-623 201 Div. 13/4
FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA
WELDED CONTINUOUS FRAMES AND THEIR COMPONENTS,
by Joseph A. Yura, and George C. Driscoll,Jr.. 1965, 10p. Rept. no. 273.26 ,Fritz-Lab. Reprint-277
Unclassified report

Prepared for presentation at AISC National Engineering Conference p76-84 Apr 1965, Memphis, Tenn. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Buildings, Structural parts), (*Structural parts, Welds), Beams (Structural), Design, Loading (Mechanics), Plasticity, Buckling (Mechanics), Steel, Structures, Mathematical analysis, Structural properties

Progress on studies for extending the use of plastic design to multi-story frames and to structures using high-strength steels is reported. 'Braced' frames designed in examples have indicated that economies are possible in comparison with methods currently used. The possibility of using a load factor of 1.7 instead of the factor of 1.85 currently used in plastic design of rigid frames has been examined. Structures using this factor should exhibit the same safety against failure as that inherent in many structures currently designed by allowable stress design. Completed tests of three-story two-bay frames are discussed in support of new design procedures. Results of studies on highstrength steels have given a tentative indication of the necessary bracing spacing and flange width-to-thickness ratios to assure that high-strength beams can be designed using concepts similar to those used for structural carbon steel beams. (Author)

AD-623 432 Div. 13/4 ,2/5
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
RESULTS OF INVESTIGATING THE ELASTIC PROPERTIES OF ROCKS IN THE REGION OF LADZHANUR HYDROELECTRIC POWER PLANT,
by G. Ya. Murusidze. May 65, 21p. Rept. no. TC-910
TT , 65-64325
Unclassified report

Rezultati Issledovaniya Uprugikh Svoistv Gornykh Porod v Rayone Ladzhanur - GES, trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Institut Geofiziki. Trudy, v18 p97-107 1959. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Engineering geology, USSR), (*Dams, Engineering geology), Civil engineering, Electric power production, Power plants (Establishments), Foundations (Structures), Rock (Geology), Elasticity, Seismology

AD-623 466 Div. 13/4 ,13/7
CFSTI Prices: HC $2.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO CONCRETE AND STRUCTURAL BRANCH
MORROW POINT DAM SHEAR AND SLIDING FRICTION TESTS,
by M. Duckworth. 4 Oct 65, 47p. Rept. no. C-1161
Unclassified report

Descriptors: (*Civil engineering, Dams), (*Dams, Engineering geology), (*Engineering geology, Dams), Foundations (Structures), Rock (Geology), Concrete, Friction, Shear stresses, Statics, Test facilities, Presses (Machinery), Environmental tests, Colorado

Information derived from shear and sliding friction tests on Morrow Point foundation rock can be used to determine sliding resistance between surfaces of jointed rock and on a concrete-rock interface. All of these field and laboratory tests to augment previous data from triaxial tests on rock cores were performed on 15- by 15- by 8-in. specimens of the dominant foundation rock, a mica schist (Type II) and a micaceous quartzite (Type III) and of concrete-on-rock. Laboratory rock samples were encased in concrete and oriented so foliation would be perpendicular to normal load and parallel to shearing load, thereby testing the weakest foliation condition. In the field, specimens were prepared in the floor of the powerplant exploratory tunnel by removing loose rock, roughly shaping by line drilling, and then chipping and bush-hammering the block to exact dimensions. The concrete-on-rock specimen was made by casting a concrete block on the sheared surface of a lower block of Type II rock. A special apparatus to fit the 5,000,000-lb testing machine was designed and built for the laboratory tests. Good correlation obtained between field and laboratory direct shear tests shows that laboratory tests of large specimens can be substituted with confidence when field tests are not feasible. The number and repeatability of the sliding friction tests indicate that they can be used to estimate sliding resistance. (Author)

AD-623 516 Div. 13/4 CFSTI PricesMF $1.00
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
DYNAMIC BEARING CAPACITY OF SOILS. REPORT 2; DYNAMICALLY LOADED SMALL-SCALE FOOTING TESTS ON DRY, DENSE SAND.
Technical rept.,
by J. K. Poplin. Sep 65, 133p. Rept. no. TR-3-599-2
Proj. 1T022601A091 02
Unclassified report

Hard copy for sale by Waterways Experiment Station, Corps of Engineers, Vicksburgh, Miss., $1.50.

Descriptors: (*Sand, Soil mechanics), (*Soil mechanics, Sand), (*Civil engineering, Foundations (Structures)), (*Foundations (Structures), Soil mechanics), Loading (Mechanics), Dynamics, Statics, Instrumentation

The results of five static and nine dynamic tests on square, rectangular, and circular footings with a contact area of 64 sq in. on the surface of dry, dense sand are reported. Dynamic load pulses of various shapes with peak footing loads 1.5 to 3.0 times the maximum static load capacity of a particular specimen, and load durations from 30 to 825 msec were used. Reaction, displacement, and acceleration of the footing were recorded. Accelerations within the specimen were sensed by accelerometers buried at various locations in the soil. Qualitative observations of displacement at various points in the specimen were made from the distortion of geometric patterns placed within and on the surface during preparation. The results of these tests indicated that the nature of displacements of a footing under dynamic loading appeared to be different from that observed for static loading. Shear surfaces, which normally develop upon failure under static loading, were not observed in the specimen after dynamic tests except for one test of relatively long duration. Displacement under peaked-pulse loading occurred in a single phase and was dependent on the intensity and duration of the load pulse. Under sustained-pulse loading, two displacement phases were observed: (a) an initial phase which was dependent on the intensity of the load, and (b) a secondary phase which was dependent on the intensity and duration of sustained loading. (Author)

AD-623 560 Div. 13/4 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
POISSON'S RATIO FOR HONEYCOMB SANDWICH CORES,
by George A. Hoffman. 23 Apr 57, 30p. Rept. no. P-946 rev.
Unclassified report

Descriptors: (*Honeycomb cores, Sandwich panels), (*Sandwich panels, Honeycomb cores), (*Strain (Mechanics), Honeycomb cores), Sandwich construction, Mechanical properties

An interesting property of honeycomb cores is that their apparent Poisson's ratio may assume values from almost zero to well above one, depending upon the shape and orientation of the cells. This unusual behavior prompted this study, wherein Poisson's ratio is derived for cores with hexagonal and square cells. The ratio is then related to the stiffness of a sandwich panel containing such cores. It is shown that large variations of Poisson's ratio for honeycomb cores have little effect on the stiffness of the sandwich panel. (Author)

AD-623 087 See Fld. 15/3

AD-623 237 See Fld. 16

AD-623 327 See Fld. 20/12

AD-623 418 See Fld. 19/4

14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-623 099 Div. 30/3 ,25/8 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE INSTRUMENTATION LAB
THERMAL-BRIDGE COMPENSATION FOR SQUAREWAVE DRIVE,
by Kenneth W. Kaiser. Aug 65, 16p. Rept. no. E-1794
Contract AF04 694 553 Proj. DSR52 227
Unclassified report

Descriptors: (*Temperature sensitive elements, Electric bridges), (*Thermostats, Calibration), (*Electric bridges, Thermostats), (*Waveform generators, Thermostats), Errors, Temperature control, Gyroscopes, Wave analyzers

Square-wave excitation of the temperature-sensing bridge in the thermal jacket of a precision gyroscope can result in improper operation of the temperature controller. A model of such a bridge is constructed using frequency-response data and the physical layout of the bridge. A successful compensation technique to allow satisfactory operation with square-wave excitation is then derived from the model.

AD-623 127 Div. 30/5 ,8/7
CFSTI Prices: HC $5.00 MF $1.00
P E C RESEARCH ASSOCIATES INC BOULDER COLO
NOTES ON A PARTIAL SURVEY OF CYBERNETICS IN EUROPE AND THE U.S.S.R.
Final rept.,
by Michael A. Arbib. 19 May 65, 159p. Contract AF49 638 1446
AFOSR ,TT 65-1412; ,65-64345
Unclassified report

Descriptors: (*Cybernetics, Reviews), (*Europe, Cybernetics), (*USSR, Cybernetics), Automata, Artificial intelligence, Bionics, Biophysics, Communication theory, Computers, Documentation, Language, Learning, Mathematical models, Models (Simulation), Nerve cells, Nervous system, Pattern recognition, Physiology, Psychology

Brief summaries are given of research activities at a number of centers and laboratories in Western and Eastern Europe. The summaries are primarily the transcribed notes of the author made during a recent trip. The research reported is that primarily classified as cybernetics in the Western sense, i.e., categorized as automata theory, neural modeling, artificial intelligence, and pattern recognition. Soviet work excels in areas such as control theory and information theory where strong mathematics is paramount. Research lags where it requires large-scale computers for non-numerical work. The report includes an introductory section which traces the historical progress of the role of cybernetics (in the Soviet sense, i.e., broadly as the science of control including problems of mathematical economics and operations research) in the Soviet society. Several appendices are included: (a) a listing associating particular scientists and groups with particular subject fields; (b) an annotated listing of some of the major journals which publish papers in cybernetics; (c) a list of references to reviews of aspects of Soviet science and education germane to the topics of the report; and (d) a random selection of Russian papers supplementary to (c). The report contains city, name, and subject indices. (Author)

AD-623 137 Div. 30/3 ,22/11
CFSTI Prices: HC $9.90 MF $2.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EQUIPMENT AND METHODS OF MEASUREMENTS DURING TESTS OF ROCKETS,
by A. V. Kantor. 14 Oct 65, 690p. Rept. no. FTD-MT-64-199
TT , 65-64393
Unclassified report

Trans. of mono. Apparatura i Metody Izmerenii pri Ispytaniyakh Raket, Moscow, 1963 p1-520. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Rockets, Test methods), Captive tests, Flight testing, Telemeter systems, USSR

In this book are presented methods and system of measurements, applied during stand and flight tests of rockets. In detail are considered telemetering and on-board measurements, external-trajectory measurements, methods of combining telemetering and external-trajectory measurements, system of single time and different aspects of stand measurements. Some light is thrown on 'the measurements themselves' together with 'processing' of obtained results. Along with systems of analog type detailed consideration is given to discrete systems of measurements and to automation in processing the results of the measurements executed during stand and flight tests. Descriptions are given of various types of equipment used for measurements during rocket tests. (Author)

AD-623 188 Div. 30/3 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
AERODYNAMIC SCALES,
by A. A. Svyapogorov. 7 Oct 65, 6p. Rept. no. FTD-TT-65-1132
TT , 65-64421
Unclassified report

Unedited rough draft trans. of Russian Patent 167 323, appl. no. 837614/26-10, 22 May 63, 2p.

Descriptors: (*Balances, Aerodynamic characteristics), Patents, Nozzles, Scale, USSR, Tensiometers, Measurement

The aerodynamic scales for investigating nozzle systems, containing chambers with a piston to balance the measured force, are different in that, to accelerate the process of measuring and increased the accuracy of measurements, a tensometric censer is used in them as a zero indicator. (Author)

AD-623 191 Div. 30/3 ,2/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CONCERNING THE THEORY OF MEASURING RAINDROP SIZE BY THE ACOUSTICAL METHOD,
by V. V. Mikhai Iovskaya. 7 Oct 65, 13p. Rept. no. FTD-TT-65-764
TT , 65-64423

Unclassified report

Unedited rough draft trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n157 (219) p48-53 1964.

Descriptors: (*Raindrops, Measurement), (*Acoustic equipment, Raindrops), Piezoelectric transducers, Test methods, Theory, USSR

This article contains experimental data showing that the potential picked-up by the transducer is proportional to the square of the diameter of a drop and to the velocity of the drop relative to the transducer. (Author)

AD-623 278 Div. 30/5 ,9/1
CFSTI Prices: HC $2.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
VELOCITY MEASUREMENTS IN A VISCOUS FLUID WITH A HOT-WIRE ANEMOMETER,
by Fred J. Contrata,Jr.. 5 Oct 65, 41p. Rept. no. USL-699

Unclassified report

Descriptors: (*Anemometers, Velocity), (*Fluid flow, Measurement), Viscosity, Laminar flow, Test equipment, Circuits, Heat transfer

The measurement of small velocities in a highly viscous fluid is impractical if standard static-impact tube methods are employed. Fluid resistance to flow is great and, consequently, measurements with a static-impact system are too time-consuming to be useful. Since a system requiring fluid movement through a constricted passage could not be employed, velocity measurements were made with a hot-wire anemometer. The investigation of the problems involved and the techniques developed in adapting the hot-wire anemometer for these velocity measurements are the subjects of the report. The hotwire sensing element was successfully calibrated by use of a current difference technique. This calibration curve was used to measure seven velocity profiles, and the resulting profiles are thoroughly discussed. The report includes a discussion of the effects of hot-wire sensing element geometry; end conduction heat loss from the hot-wire sensing element; radial temperature gradient at the test section; and the effect of the hot-wire probe on the measurements under certain conditions. Recommendations are made for the design of an improved hot-wire probe and an improved hot-wire sensing element positioning device together with a recommended technique for the extensions of the calibration curve. (Author)

AD-623 311 Div. 30/3
API INSTRUMENTS CO CHESTERLAND OHIO
PRODUCTION ENGINEERING MEASURE FOR METERS, TAUT-BAND SUSPENSION, A-C MOVING IRON VANE PER SIGNAL CORPS REQUIREMENTS SCS-160.
Quarterly rept. no. 9, 1 May-31 Jul 65,
by R. H. Nichols. 31 Jul 65, 8p. Contract DA36 039AMC01473E

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale. See also AD-621 211.

Descriptors: (*Measuring devices (Electrical + electronic), Manufacturing methods), Voltmeters, Ammeters, Performance (Engineering), Suspension devices, Tests, Production

Preproduction tests on one item have been completed. Outstanding performance of the taut-band suspension resulted in performance that was consistently better than the specification required. Group V preproduction tests on two other items also were successfully completed. Preproduction samples required to complete tests on a total of three items are essentially complete and ready for testing. Preparations for the pilot runs are well under way with nearly all pilot line tooling completed. (Author)

AD-623 361 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
HUGHES AIRCRAFT CO CULVER CITY CALIF LIBRARY
DIAPHRAGMS, A SELECTED BIBLIOGRAPHY,
by J. Seremak. Oct 65, 15p. Rept. no. LS-B1B-65-1

Unclassified report

Descriptors: (*Diaphragms (Mechanics), Bibliographies), Metals, Rupture, Safety valves, Design, Manufacturing methods

The selective bibliography contains 135 references on design and manufacture of metallic diaphrams including a complete search on bursting diaphragms. The bibliography covers period from 1920 to 1965, and includes unclassified reports and titles from open literature.

AD-623 387 Div. 30/6 ,13/1
CFSTI Prices: HC $3.00 MF $0.75
LINDE DIV UNION CARBIDE CORP INDIANAPOLIS IND
PERFORMANCE IMPROVEMENT OF ARC HEATERS FOR AERODYNAMIC WIND TUNNELS.
Final rept. for 15 Apr 64-14 Jun 65,
by Richard C. Eschenbach, James R. McLeod, and Edward F. Stresino. Aug 65, 97p. Contract AF33 615 1749 Proj. 1426 Task 142608
FDL , TR-65-87

Unclassified report

Descriptors: (*Wind tunnels, Heaters), (*Heaters, Electric arcs), (*Enthalpy, Heaters), Performance (Engineering), Aerodynamic characteristics, Scale, Thermal radiation

Three avenues for increasing the enthalpy attainable from scalable high performance arc heaters were studied: radiation loss reduction, magnetic control of arc terminations and geometry changes. The radiation loss work showed centerline arc column enthalpies over 30,000 Btu/lb. Because the arc column is optically thin, substantial reduction of radiation loss seems infeasible. Large arc devices will be limited more by radiation than small. Modest improvements in performance were achieved with magnetic interactions, which were found to be extremely complex. Proper proportioning of radial and axial field components was quite important, especially in maintaining scalability. Marked undesirable effects occurred when the auxiliary field coil was located near the electrode gap. Distinct performance improvements were achieved by changes in geometry, with air injection and chamber design the most significant for the low flow, high current region studied. (Author)

AD-623 597 Div. 30/3 ,8/4
CFSTI Prices: HC $1.00 MF $0.50
LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV
DEVELOPMENT OF EXPERIMENTAL GAS DISCHARGE DISPLAY.
Quarterly progress rept. no. 8, 24 Jun-24Sep 65. Oct 65, 14p. Rept. no. GRR-65-1109
Contract NObsr89201 Proj. SR0080301 Task 9498

Unclassified report

See also AD-620 111.

Descriptors: (*Gas discharges, Display systems), (*Discharge tubes, Display systems), (*Display systems, Discharge tubes), Panels (Structural), Electric trigger controls, Feasibility studies, Fracture (Mechanics)

Progress is reported on a program to develop an experimental prototype gas discharge display panel with internal storage capability. The panel will consist of an X-Y matrix of individual gas cells, each of which can be selected and fired by the application of a short triggering pulse. The objectives are to develop a display with high light output, low firing and distribution voltages, and a configuration such that eventual production panels can be fabricated at the lowest possible cost per unit cell.

AD-623 611 Div. 30/5 ,17/2
LINCOLN LAB MASS INST OF TECH LEXINGTON
MAGNETIC MEASUREMENTS WITH LORENTZ MICROSCOPY,
by M. S. Cohen. 19 Mar 65, 12p.

Unclassified report

Pub. in IEEE Transactions on Magnetics, vMAG1 n3 p156-67 Sep 1965. (Copies not available to DDC or Clearinghouse customers). Presented at the INTERMAG Conference, Washington, D. C.

Descriptors: (*Metal films, Magnetic properties), (*Electron microscopy, Metal films), Nickel alloys, Iron alloys, Anisotropy, Creep, Transition temperature

Lorentz microscopy is a powerful technique for investigating thin NiFe films because it offers high resolution, because it provides an unequivocal identification of the local magnetization direction, and because it permits correlations to be made between the magnetic structure and the underlying physical (crystallographic) structure of the film. The following measurements are discussed: (1) determination of the Curie temperature; (2) measurement of the anisotropy field H sub K by the standard hysteresigraph and the Feldtkeller techniques; (3) quantitative studies of wall motion by labyrinth propagation and by wall creep; (4) the investigation of anisotropy dispersion by the Crowther and Torok techniques. The accuracy of these measurements is, in general, lower than that of the analogous measurements made by macroscopic methods on films deposited on glass substrates. Nevertheless, macroscopic measurements performed on a film on a glass substrate showed good agreement with Lorentz measurements performed on a simultaneously-deposited film which was suitable for Lorentz microscopy.

AD-623 639 Div. 30/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
SIZE ANALYSIS OF MINUS 44 MICRON DUST PARTICLES,
by Melvin J. Nuckolls, and Ross K. Fuller. 19 Aug 65, 12p. Rept. no. usnrdl-TR-907
Proj. PMR WR4 0015 ,NWET2 6a

Unclassified report

Descriptors: (*Dust, Particle size), Ultrasonic radiation, Analysis, Nuclear explosions, Gas filters

A method of particle size analysis utilizing ultrasonic energy and Micro Mesh sieves has been developed for dust particles with diameters less than 44 microns. The particle size distributions of volcanic dust and dust from ground surface explosions were determined. The new method yields discrete particle size fractions, rather than fractions that contain all particle sizes less than a stat-

ed size, as produced by liquid sedimentation methods. Particulate samples were wet sieved through a 44-micron Tyler sieve onto a 40-micron Micro Mesh sieve. The surface of the screen and the particles were immersed in water in an ultrasonorator tank for a few minutes. Particles with diameters less than 40 microns passed through and were collected and transferred to a 30 micron screen. The process was repeated for 30-, 20-, and 10-micron Micro Mesh sieves. Each sieve and the material retained by it were dried in an oven at 110C. The dried particles were recovered, weighed, and later used for photomicrographic studies, density measurements, etc. (Author)

AD-623 097 See Fld. 12/1

AD-623 160 See Fld. 4/2

AD-623 166 See Fld. 17/1

AD-623 254 See Fld. 20/8

AD-623 261 See Fld. 9/2

AD-623 316 See Fld. 11/7

AD-623 430 See Fld. 8/14

AD-623 455 See Fld. 20/4

AD-623 456 See Fld. 20/4

AD-623 457 See Fld. 20/4

AD-623 491 See Fld. 21/5

AD-623 494 See Fld. 6/3

AD-623 582 See Fld. 4/2

AD-623 633 See Fld. 7/2

AD-623 682 See Fld. 4/2

AD-623 698 See Fld. 12/1

14/5. REPROGRAPHY

AD-623 412 Div. 24/2
CFSTI Prices: HC $5.00 MF $1.00
XEROX CORP ROCHESTER N Y
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept., no. 2, 15 Sep-15 Dec 48, by R. M. Schaffert, L. R. Jackson, A. E. Middleton, L. E. Walkup, and D. T. Williams. 15 Dec 48, 162p. Contract W36 039sc36851 Proj. DA3 99 04 052 ,195B
Unclassified report

Subcontracted to Battelle Memorial Inst., Columbus, Ohio. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-623 413.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrography), Photographic film, Selenium, Vapor plating, Vacuum apparatus, Binders, Photographic images, Electrostatics, Photoconductivity

Contents: Investigations of the electrophotographic properties of evaporated sblenium films, Experiments on selenium electrophotographic films made by other methods than evaporation, Preliminary theory relating electrophotographic sensitivity with molecular structure in sensitive films, Advanced experiments pertinent to verifying and extending the theory and advantageously using the structural classification to find new electrophotographic materials, Experimental work on plate preparation by vacuum evaporation, Experimental work on developing techniques, and Measurement of resistivity of a selenium binder with vibrating probe electrometer.

AD-623 413 Div. 24/2
CFSTI Prices: HC $3.00 MF $0.75
XEROX CORP ROCHESTER N Y
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly rept. no. 4, 15 Mar-15 Jun 49, by R. M. Schaffert, D. T. Williams, and L. E. Walkup. 15 Jun 49, 84p. Contract W36 039sc36851 Proj. SC195B ,DA3 99 04 052
Unclassified report

Subcontracted to Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Electrophotography, Photographic materials), (*Photographic plates, Electrophotography), Photographic film, Selenium, Vapor plating, Vacuum apparatus, Recording systems, Theory, Photoconductivity

Contents: Experimental work on plate-developing techniques, Experiments on vacuum-evaporated selenium electrophotographic plates, Instrumentation, and Theory.

AD-623 255 See Fld. 8/10

AD-623 260 See Fld. 17/2

AD-623 569 See Fld. 20/4

AD-623 685 See Fld. 17/8

15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

AD-623 235 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH.
16 Mar 64, 18p. Rept. no. AID-U-64-11
TT , 65-64446
Unclassified report

Compilation of abstracts from Soviet bloc literature of entries from AID-Bibliography B-63-52. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Microorganisms, Immunology, Aerosols, Radioprotective agents, Military strategy, Countermeasures, Passive defense

Twenty abstracts from Soviet and Soviet-bloc sources are included. The topics are related to chemical and biological warfare, with special emphasis on aerosol immunization.

AD-623 236 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH.
16 Mar 64, 19p. Rept. no. AID-U-64-12
TT , 65-64447
Unclassified report

Compilation of abstracts of entries from AID Bibliography B-63-52.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Microorganisms, Epidemiology, Immunology, Decontamination, Military strategy, Passive defense, Radiological warfare, Aerosols

Twenty abstracts from Soviet and Soviet-bloc sources are included. The topics are related to chemical and biological warfare, with special emphasis of epidemiology, immunology, and defense measures.

AD-623 238 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH.
18 Mar 64, 19p. Rept. no. AID-U-64-14
TT , 65-64449
Unclassified report

Compilation of (22) abstracts of entries from AID Bibliography B-63-52.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Detection, Countermeasures, Microorganisms, Immunology, Radiological warfare, Armed forces operations, Aerosols, Military strategy, Chemical warfare agents, Passive defense

Twenty-two abstracts from Soviet and Soviet-bloc sources are included. The topics are related to chemical and biological warfare, with special emphasis on detection and countermeasures.

AD-623 239 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH.
19 Mar 64, 18p. Rept. no. AID-U-64-16
TT , 65-64450
Unclassified report

Compilation of abstracts of entries from AID-B-63-52.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Immunology, Epidemiology, Countermeasures, Armed forces operations, Passive defense, Radiological warfare, Aerosols, Reconnaissance, Microorganisms

Twenty abstracts from Soviet and Soviet-bloc sources are included. The topics are related to chemical and biological warfare, with special emphasis on immunization and defense measures.

AD-623 243 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH: COMPILATION OF ABSTRACTS FROM SOVIET-BLOC LITERATURE.
Rept. no. 5 on AID Work assignment no. 50-A.
4 Apr 64, 19p. Rept. no. AID-U-64-22
TT , 65-64454
Unclassified report

Consists of twenty abstracts, requested by users, of entries from AID Bibliography B-63-52.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Immunology, Epidemiology, Microorganisms, Radiological warfare, Countermeasures, Toxins + antitoxins, Passive defense, Armed forces operations

The abstracts are related to chemical and biological warfare, with emphasis on immunology and countermeasures.

AD-623 245 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH: COMPILATION OF ABSTRACTS FROM SOVIET-BLOC LITERATURE.
Rept. no. 6 on AID Work assignment no. 50-A.
21 Apr 64, 13p. Rept. no. AID-U-64-27
TT , 65-64456
Unclassified report

Consists of eighteen abstracts, requested by users, of entries from AID Bibliography B-63-52.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Microorganisms, Immunology, Epidemiology, Aerosols, Toxins + antitoxins, Sampling

The abstracts are related to chemical and biological warfare, with emphasis on immunology and aerosols.

AD-623 250 Div. 3/1 ,3/7 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET CHEMICAL AND BIOLOGICAL RESEARCH: COMPILATION OF ABSTRACTS.
Rept. no. 7 on AID Work assignment no. 50-A.
15 May 64, 15p. Rept. no. AID-U-64-39
TT , 65-64461
Unclassified report

Consists of seventeen abstracts, requested by users, of entries from AID Bibliography B-63-52. Rept. on Surveys Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Chemical warfare, USSR), (*Biological warfare, USSR), Reviews, Microorganisms, Immunology, Epidemiology, Toxins + antitoxins, Passive defense, Pathology, Public health, Smokes

The abstracts are from literature related to chemical and biological warfare, with special attention to epidemiology and bacterial toxoids.

AD-623 502 Div. 3/7 ,16/11
CHEMICAL CORPS MEDICAL LABS ARMY CHEMICAL CENTER MD
TOXIITY OF SARIN IN BULLFROGS,
by Charles G. Wilber. 24 Jun 54, 2p.
Unclassified report

Pub. in Science v120 n3112 p322 Aug 20 1954 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sarin, Toxicity), (*Amphibians, Toxic tolerances), Adaptation (Physiology), Cholinesterase inhibitors

It is evident that the bullfrog is resistant to relatively large amounts of sarin given by injection. The only signs of poisoning noticed were observed in frogs given doses exceeding 1 mg. The explanation of the great resistance to, and surprising recovery from, sarin poisoning in bullfrogs is not certain.

15/3. DEFENSE

AD-623 087 Div. 18/1 ,20/7 ,13/10,32/1
CFSTI Prices: HC $6.00 MF $1.25
DIKEWOOD CORP ALBUQUERQUE N MEX
DEVELOPMENT OF 'TYPICAL' URBAN AREAS AND ASSOCIATED CASUALTY CURVES.
Final rept.,
by L. Wayne Davis, Francis J. Wall, and Donald L.Summers. Apr 65, 210p. Rept. no. DC-FR-1041
Contract OCD PS64 47 Proj. 4621B
Unclassified report

Descriptors: (*Nuclear warfare casualties, Mathematical prediction), (*Nuclear explosion damage, Buildings), (*Urban areas, Nuclear explosion damage), Urban planning, Statistical analysis, Vulnerability, Housing, Graphics, United States

A block-by-block, building-by-building survey of information from the Sanborn maps was conducted. Occupancy, block area, total floor area, height, number of floors, construction details, etc. were recorded for each building in the block being surveyed. These data were punched on IBM cards, verified, and put on magnetic tape. Computer summaries were then made of these data. From these summaries statistical analyses were made to detect whether any differences in construction occurred for given land uses due to (1) geographic region and (2) urban area size. From these results lists of typical urban areas were developed. From these basic data it was then possible to draw total mortality and total injury curves for an unwarned population (daytime) for each of the ten typical urban areas. These curves are presented for surface and the Hiroshima scaled height of burst (846 feet) and for yields of 0.4, 1, 4, 10, 25, and 50 Mt. Capability is also provided for estimating casualties in a nighttime and a warned configuration. With this set of casualty curves classified by typical urban area and with land-use maps for the various cities of interest across the country, one is in a position to make both a practical and realistic casualty assessment on a national scale. (Author)

AD-623 304 **See Fld. 5/9**

AD-623 462 **See Fld. 5/1**

AD-623 464 **See Fld. 5/10**

15/4. INTELLIGENCE

AD-623 608 **See Fld. 8/6**

15/5. LOGISTICS

AD-623 195 Div. 18/3 ,8/2
CFSTI Prices: HC $6.00 MF $1.25
IIT RESEARCH INST CHICAGO ILL
DEVELOPMENT OF THE DETAILED PLAN FOR A RELIABILITY CENTRAL. VOLUME I. IMPLEMENTATION PLAN.
Final rept., vol. 1, 27 Apr 64-26 Jan 65,
by M. E. Goldberg, R. S. Hollitch, G. T. Jacobi, H. A. Lauffenburger, and E. S. Schwartz. Oct 65, 234p. Rept. no. IITRI-E-6018-3 v1
Contract AF30 602 3426 Proj. 760E ,5519 Task 551902
RADC , TR-65-94 V1
Unclassified report

See also AD-623 196.

Descriptors: (*Weapon systems, Quality control), (*Reliability (Electronics)I, Data processing systems), (*Data processing systems, Reliability (Electronics)), Data, Electronic equipment, Information retrieval, Air Force equipment, Logistics

Reliability data on electronic components is essential for Air Force System designs, procurement and specification review. This report delineates the functions and methods of operation of a Reliability Central adequate to meet these requirements. It constitutes an implementation study leading in progressive steps to an operation which will perform data collection, retrieval and analysis over a wide spectrum of electronic component parts. Diverse users of analyses both within and outside the Air Force are considered in detail. The report describes the required classes of data, a data processing system required for its acceptance, retrieval and analysis, and provides detailed description of the proposed outputs and services. Volume One describes the proposed implementation plan and recommendations. Volume Two contains more detailed technical information, backup and rationale for these recommendations. (Author)

AD-623 196 Div. 18/3 ,8/2
CFSTI Prices: HC $7.35 MF $2.00
IIT RESEARCH INST CHICAGO ILL
DEVELOPMENT OF THE DETAILED PLAN FOR A RELIABILITY CENTRAL. VOLUME II. DETAILED CONSIDERATIONS FOR R/C IMPLEMENTATION.
Final rept., vol. 2, 27 Apr 64-26 Jan 65,
by M. E. Goldberg, R. S. Hollitch, G. T. Jacobi, H. A. Lauffenburger, and E. S. Schwartz. Oct 65, 433p. Rept. no. IITRI-E-6018-3 v2
Contract AF30 602 3426 Proj. 5519 Task 551902
RADC , TR-65-94 V2
Unclassified report

See also AD-623 195.

Descriptors: (*Weapon systems, Quality control), (*Reliability (Electronics), Data processing systems), (*Data processing systems, Reliability (Electronics)), Data, Electronic equipment, Information retrieval, Air Force equipment, Logistics

Reliability data on electronic components is essential for Air Force Systems designs, procurement, and specification review. This final report delineates the functions and methods of operation of a Reliability Central adequate to meet these requirements. It constitutes an implementation study leading in progressive steps to an operation which will perform data collection, retrieval, and analysis over a wide spectrum of electronic component parts. Diverse users of analyses both within and outside the Air Force are considered in detail. The report describes the required classes of data, a data processing system required for its acceptance, retrieval, and analysis, and provides detailed description of the proposed outputs and services. Volume One constitutes a detailed plan for the implementation of Reliability Central, together with summary descriptions of its inputs, outputs, and its relation to other groups. Volume Two contains detailed technical discussions in support of the recommended implementation plan. (Author)

AD-623 226 Div. 18/3
CFSTI Prices: HC $3.00 MF $0.75
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-2.
1965, 88p.
Unclassified report

Papers prepared for presentation to Panel on Procurement Practices (Panel 2) at Dept. of Defense Logistics Research Conference held at Airlie Conference Center, Warrenton, Va., 26-28 May 65.

Descriptors; (*Logistics, Symposia), United States Government, Department of Defense, Armed forces procurement, Government procurement, Air force procurement, Defense systems, Economics, Costs, Federal budgets, Operations research

Contents: Procurement of research and development; Government contracting for services; Flexible incentives; Discussion of cost-plus-award-fee

contracts; A view of the DOD cost and economic system as a tool in contract pricing; Use of technical direction clauses; Proposed research on incentive contracting; Ultimate costs in procurement and system and organization for cost analysis; Proposal of a variable quantity contract; Defense vs. public utility pricing; Roles and functions in contract costs analysis; Review of Air Force procurement 1962-1964 (Abstract); Public policy toward subcontracting (Abstract).

AD-623 227 Div. 18/3
CFSTI Prices: HC $6.00 MF $1.25
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-3.
1965, 224p.

Unclassified report

Prepared for presentation to the Panel on Government/Industry Development and Production (Panel 3) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va. 26-28 May 65.

Descriptors: (*Logistics, Symposia), Armed forces procurement, Defense systems, Management planning, Industries, Government procurement, Federal budgets, Costs, Systems engineering, Maintenance, United States Government, Department of Defense

Contents: Integrated logistic support for systems and equipment; Implementation of integrated logistics support; Logistics considerations in warfare systems development; Integrated logistics support planning; Technical data base for integrated logistic support; Study of logistics management: The Army's project management concept; Study of logistics management value engineering research; Improved support of the logistics manager through uniform field contract administration services; Five games played by Government and Industry in the system acquisition process; The designer's impact on logistics; Procurement and the systems engineer; The logistics manager and the militaryindustry relationship in the development, production and procurement of materiel.

AD-623 228 Div. 18/3
CFSTI Prices: HC $6.00 MF $1.25
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-4.
1965, 233p.

Unclassified report

Prepared for presentation to Panel on Practical Inventory Theory (Panel 4) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65.

Descriptors: (*Logistics, Symposia), Army procurement, Naval procurement, Inventory control, Costs, Mathematical analysis, Armed forces procurement, Management planning, Decision making, Federal budgets, Operations research, Stochastic processes, Tables

Contents: Development of the stochastic-demand methods of supply-readiness control being used by the Army; Implementation of inventory control theory in the U. S. Army; Research problems and accomplishments for Navy inventory management; Implementation of inventory research findings in the Navy; Practical aspects of economic order quantities; Progress and problems of research implementation at the operational level; Status of mathematical inventory theory; Future directions of research in inventory theory; Program library approach for implementing results of logistics research.

AD-623 229 Div. 18/3
CFSTI Prices: HC $6.00 MF $1.25
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-5.
1965, 202p.

Unclassified report

Prepared for presentation to Panel on Maintenance and Repair Concepts (Panel 5) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requsted by users of DDC. Copy is available for public sale.

Descriptors: (*Logistics, Symposia), Maintainability, Design, Costs, Maintenance, Reliability, Ships, Mathematical analysis, Replacement theory, Spare parts, Scheduling, Management planning, Decision making

Contents: Maintainability prediction and design: Prediction of the cost and time of maintenance; Maintainability design and maintainability-reliability-maintenance interrelations; Predicting the cost and time of maintenance; Establishment of maintenance doctrine: Analysis of maintenance capabilities; Economic considerations in establishing an overhaul cycle for ships: An empirical analysis; Some quantitative aspects of materiel readiness and maintenance; Supporting requirements: Prediction of optimal facility requirements; Replacement theory; Repair part essentiality analysis; Workload measurement scheduling: Current approaches to solving workload scheduling, prediction, distribution and smoothing problems; Management and information systems: Information needs for effective maintenance management; Maintenance management education program.

AD-623 230 Div. 18/3
CFSTI Prices: HC $4.00 MF $0.75
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-6.
1965, 106p.

Unclassified report

Prepared for presentation to Panel on Logistics Information (Panel 6) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Logistics, Symposia), Command + control systems, Military strategy, Management control systems, Inventory control, Management planning, Decision making, Systems engineering, Computers, Maintenance, Department of Defense, Armed forces procurement, Government procurement, Information retrieval, Data processing systems

Contents: Command information requirements; Remarks on the ordering of information; Nature and importance of classification research in logistics information systems; Research in the management of information and data systems; Operational approach to logistics information systems; Information problems in government-industrial logistics.

AD-623 231 Div. 18/3
CFSTI Prices: HC $5.00 MF $1.00
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-7.
1965, 164p.

Unclassified report

Papers prepared for presentation to Panel on Cost Effectiveness Models and Evaluation (Panel 7) at the Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65.

Descriptors: (*Logistics, Symposia), Army procurement, Naval procurement, Air force procurement, United States Government, Federal budgets, Department of Defense, Costs, Effectiveness, Mathematical models, Operations research, Military personnel, Decision making, Attitudes

Contents: Cost effectiveness analysis within the Army; Cost effectiveness projects in the Department of the Navy; Recent mathematical modeling/cost effectiveness projects in the Department of the Air Force; Military essentiality; Cost effectiveness for integrated logistics support systems and equipment (DOD Directive 4100.35); Summary and evaluation of recent work in measuring the productivity of federal agencies; Chance-constrained programming and related approaches to cost effectiveness; Three levels of analysis of cost-effectiveness associated with personnel attitudes and attributes; Committee decisions.

AD-623 232 Div. 18/3
CFSTI Prices: HC $5.00 MF $1.00
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-8.
1965, 158p.

Unclassified report

Prepared for presentation to Panel on Measurement of Logistics Performance/Effectiveness (Panel 8) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Logistics, Symposia), Army, Navy, Air force procurement, Management planning, Decision making, Inventory control, Ships, Submarines, Costs, Effectiveness, Obsolescence theory, Maintenance, Weapon systems, Stock level control, Mathematical models, Statistical analysis

Contents: Measuring and evaluating logistics activities; Army logistical objectives and programs; Potential problems in measuring and evaluating logistic activities; Results of exploratory research for developing shipboard allowance lists; Critique of METRI; Product improvement candidate selection and management information; Measuring and evaluating logistics support among echelons for a submarine force; New cost model to support Air Force long-range planning; Statistical approach to work measurement; Measurement and evaluation of subordinate decision-making activity within an organizational setting; Equipment use program.

AD-623 233 Div. 18/3 ,30/2
CFSTI Prices: HC $5.00 MF $1.00
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-9.
1965, 156p.

Unclassified report

Prepared for presentation to Panel on Logistics Simulation (Panel 9) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va., 26-28 May 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.

Descriptors: (*Logistics, Symposia), Computers, Simulation, Data processing systems, Operations research, Management planning, Food dispensing, Storage, Ships, Military personnel, Supply depots, Spare parts, Distribution, Military requirements, Game theory, Programming (Computers), Feedback, Mathematical models

Contents: Area I: Application of computer simulations in logistics research and operations: Use of computer simulations in logistics management training; Application of simulation to two supply operations: Food service facilities and shipboard storerooms; Military personnel system simulation; Simulation for depot requirements and distribution of spares; Wholesale logistics policy and simulation; Area II: Problems in developing and using simulations in logistics research and operations; Simulation and dissimulation; Technical problems of simulation development; Area III: Techniques likely to increase the effective use of computer simulations; Games as an aid to simulation development; Simulation programing and analysis of results; Variance reduction techniques; Some properties of feedback systems as a guide to the analysis of complex simulation models.

AD-623 234 Div. 18/3
CFSTI Prices: HC $4.00 MF $0.75
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE HELD AT THE AIRLIE CONFERENCE CENTER, WARRENTON, VIRGINIA, 26-28 MAY 1965.
Abstracts.
1965, 118p.
Unclassified report

Descriptors: (*Logistics, Symposia), Department of Defense, United States Government, Government procurement, Federal budgets, Armed forces procurement, Management planning, Decision making, Operations research, Costs, Effectiveness, Maintenance, Economics, Mathematical models, Industrial production, Data processing systems, Information retrieval, Personnel management, Abstracting

The volume contains abstracts of the individual professional papers prepared for presentation to the nine panels of the Department of Defense Logistics Research Conference held at the Airlie Conference Center, Warrenton, Virginia, 26-28 May 1965. The professional papers have been published in separate volumes pertaining to panel subjects as follows: Volume II-1 Logistics planning elements; Volume II-2 Procurement practices; Volume II-3 Government/ Industry development and production; Volume II-4 Practical inventory theory; Volume II-5 Maintenance and repair concepts; Volume II-6 Logistics information systems; Volume II-7 Cost effectiveness models and evaluation; Volume II-8 Measurement of logistics performance/effectiveness; Volume II-9 Logistics simulations.

AD-623 283 Div. 18/3 ,26/2
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SIMULATION AND EVALUATION OF LOGISTICS SYSTEMS,
by B. J. Voosen. Sep 65, 31p. Rept. no. RM-4589-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.

Descriptors: (*Models (Simulation), Logistics), (*Logistics, Weapon systems), Management planning, Systems engineering, Transportation, Maintenance, Costs

A description of PLANET (Planned Logistics Analysis and Evaluation Technique), designed to increase the possibility of discovering flaws in a weapon system before it becomes operational. Through testing, PLANETcan obtain a measure of the costs of logistics support for various hardware configurations and operational requirements. It can also help in estimating needs, at various levels of reliability and maintainability, for maintenance manpower, equipment, and spare parts. Even though PLANET cannot optimize the hardware configuration, it permits examination of different configurations. It thereby allows the planner to quantify the relative effects of decisions during the planning and operating phases of a weapon system. (Author)

AD-623 382 Div. 18/3
CFSTI Prices: HC $4.00 MF $1.00
DEPARTMENT OF DEFENSE WASHINGTON D C
LOGISTICS RESEARCH CONFERENCE, VOLUME II-1.
1965, 135p.
Unclassified report

Prepared for presentation to the Panel on Logistics Planning Elements (Panel 1) at Dept. of Defense Logistics Research Conference, Airlie Conference Center, Warrenton, Va. 26-28 May 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Logistics, Symposia), Management planning, Decision making, Cold war, Limited war, Warfare, Mobilization, Military requirements, Military strategy, Armed forces procurement, Department of Defense, Army, Operations research

Contents: Logistics planning for radiness; Logistic planning elements; Economics of logistics planning - the planning process, planning elements and planning factors; Logistics planning elements - long range planning; Problems of logistic planning for emergency operations in under-developed regions; Planning for balanced readiness; Army support unit planning.

AD-623 583 Div. 18/3 ,33/1
CFSTI Prices: HC $2.00 MF $0.50
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND POLITICAL STUDIES DIV
AN APPROACH TO THE LOADING OF TRANSPORT AIRCRAFT.
Research paper,
by Martin J. Bailey. Oct 65, 46p. Rept. no. RP-P-175 ,IDA/HQ-65-3501
Contract SD-50 Task ISA5
Unclassified report

Descriptors: (*Logistics, Transport planes), (*Transport planes, Cargo), (*Cargo, Handling), Optimization, Design, Management planning, Effectiveness, Simulation, Armed forces transportation, Scheduling

The approach concentrates on limiting the main potential sources of inefficient loading. That is, rather than seek the most efficient loading of a given set of equipment on a given fleet of aircraft, the procedure set forth avoids gross inefficiencies and thus reasonably approximate the most efficient loading. The first step in such an approach is to review the loadings accomplished by other simulators and by loadmasters in order to identify systematic inefficiencies due to aircraft and equipment characteristics. The review suggests several specific ways in which loading might be improved and provides a set of factors to consider in selecting the order in which to load equipment.

AD-623 237 **See Fld. 16**

AD-623 258 **See Fld. 5/1**

AD-623 275 **See Fld. 5/1**

15/7. OPERATIONS, STRATEGY, AND TACTICS

AD-623 091 Div. 18/7 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
COMPUTER-AIDED INFORMATION SYSTEMS FOR GAMING.
Technical paper,
by Joseph O. Harrison,Jr., and Mary Frances Barrett. Sep 64, 43p. Rept. no. RAC-TP-133
Unclassified report

Descriptors: (*Strategic warfare, Simulation), (*Armed forces operations, Game theory), (*Game theory, Armed forces operations), Army operations, Aerial warfare, Strategic warfare, Operations research, Air force operations, Warfare, Military tactics, Decision making, Monte Carlo method, Analog computers, Digital computers, Data processing systems, Decision making

Scientific war games have been under development by military operations research groups since about 1960 and business games by industrial operations research groups since 1956. From an information system point of view these games may be divided into three types--computer simulations, digital man-machine games, and continuous variable man-machine games. Computer simulations, or completely automated games, (i.e. Carmonette, AD-257 012) are always rigid, usually stochastic, and generally very detailed. Since they are not limited by the decision-making speed of human beings, they may be executed rapidly, permitting repeated plays with large-scale variations of input conditions and chance factors. Digital man-machine games, or partly mechanized games, (i.e. Theaterspiel) employ digital computers for bookkeeping, computing, and transmission of data but use people for decision making. In digital man-machine games both speed of execution and level of detail are sacrificed in the interests of obtaining the flexibility of human participation. Continuous variable man-machine games employ people for decision making and electronic analog computers for computation. The human decisions are introduced continuously as the game proceeds rather than periodically. (Intended as a chapter in a book to be published by McGraw-Hill, 'Fundamentals of Information System Science and Engineering.')

AD-623 135 **See Fld. 5/10**

AD-623 305 **See Fld. 19/5**

AD-623 396 **See Fld. 17/7**

AD-623 462 **See Fld. 5/1**

16. MISSILE TECHNOLOGY

AD-623 237 Div. 12/3 ,33/2 ,33/3 ,13/4 ,+
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET LITERATURE ON PROTECTIVE STRUCTURES AND COMPONENTS.
16 Mar 64, 14p. Rept. no. AID-U-64-13 TT , 65-64448
Unclassified report

Compilation of abstracts from Soviet literature for 26 Sep-29 Dec 63. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Illustrations are not fully legible.. Copy is available for public sale.

Descriptors: (*Guided missiles, Ground support equipment), (*Ground support equipment, (USSR), Nuclear power plants, Roads, Transportation, Construction, Hoists, Packaging, Containers, Railroad cars, Launching sites

The report is the eleventh in a series of reports reviewing Soviet literature on ground support equipment. It is based on materials received by the Aerospace Information Division between 26 September and 29 December 1963 and is prepared in response to AID work Assignment No. 13, which

covers the following broad areas of interest: Operational employment and philosophy; Missile data; Facilities; Transport; Launch site; Ground support equipment; Natural environmental conditions; Personnel; Research and development facilities; Packing, preservation, and storage. The report contains materials relevant to Topics III, IV, V, and X. A list of references in alphabetical order by author is given at the end of the text. Library of Congress call numbers are included at the end of the source entry when the source is available in the collections of the Library of Congress. (Author)

AD-623 120 **See Fld. 1/3**

AD-623 170 **See Fld. 22**

AD-623 330 **See Fld. 20/4**

AD-623 336 **See Fld. 22**

AD-623 433 **See Fld. 17/2**

AD-623 450 **See Fld. 22**

AD-623 452 **See Fld. 22**

AD-623 532 **See Fld. 4/2**

AD-623 558 **See Fld. 5/10**

AD-623 563 **See Fld. 20/4**

AD-623 587 **See Fld. 17/8**

AD-623 603 **See Fld. 4/2**

AD-623 620 **See Fld. 20/3**

AD-623 628 **See Fld. 22**

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

AD-623 279 **See Fld. 22**

AD-623 408 **See Fld. 22**

AD-623 628 **See Fld. 22**

17/1. ACOUSTIC DETECTION

AD-623 166 Div. 6/1 ,30/4
CFSTI Prices: HC $1.00 MF $0.50
NAVY ELECTRONICS LAB SAN DIEGO CALIF
PRESSURE VESSEL FOR CALIBRATING SONAR TRANSDUCERS. ACOUSTICALLY TRANSPARENT FIBER GLASS CAPSULE PERMITS TESTING AT PRESSURES TO 800 PSIG.
Research and development rept. for Oct 64-Mar 65,
by C. E. Green. 26 Jul 65, 21p. Rept. no. NEL-1301
Proj. SF101 03 18 Task 8049
Unclassified report

Descriptors: (*Pressure vessels, Test facilities), (*Glass textiles, Pressure vessels), (*Sonar equipment, Calibration), (*Transducers, Sonar equipment), Pressure, Acoustic equipment, Sound transmission, High-pressure research, Acoustic impedance

Acoustically transparent vessel houses a single transducer for testing under pressure to 800 psig. Tests of B24FA transducer indicate marked difference in transmitting response at depth. (Author)

AD-623 360 Div. 6/1 ,25/1
CFSTI Prices: HC $2.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
OPTIMUM ARRAY GAIN FOR DIRECTIONAL NOISE.
Research rept.,
by Clair J. Becker, and Benjamin F. Cron. 5 Oct 65, 39p. Rept. no. USL-656
Proj. BuShips SF001 03 15 Task 11285
Unclassified report

Descriptors: (*Sonar equipment, Gain), (*Gain, Optimization), Acoustic equipment, Noise, Noise analyzers, Sonar receivers

From the definition of array gain, the gain of a linear array of point receivers is given in terms of spatial correlation of the noise. The theoretical methods of obtaining spatial correlation for directional noise are reviewed. An experimental verification of the theory is also presented. Under consideration is an 8-element vertical array of equispaced elements perpendicular to the surface of the ocean. The gain is computed for the cases of a single frequency and of narrow-band and wide-band frequencies. The effects of both broadside and endfire steering are analyzed. The gain is computed as a function of the spacing between elements for the case of uniform shading. For each configuration, the gain for optimum shading is obtained. For the case of isotropic noise and narrow-band frequency, the gain is on the order of 10 log 8, or about 9 db. For the case of directional noise, narrow-band frequency (750-850 cps), broadside steering, and uniform shading, the gain is on the order of 17 db for optimum spacing. An additional 2 db is obtained for the case of optimum shading at the optimum spacing configuration. (Author)

AD-623 679 Div. 6/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ACOUSTIC PHASED ARRAYS FOR THE DETECTION OF NUCLEAR BURSTS IN THE ATMOSPHERE,
by T. F. Burke. Oct 65, 30p. Rept. no. RM-4722-ARPA
Contract SD-79 Proj. arpa order 189 61
Unclassified report

Descriptors: (*Nuclear explosions, Detection), (*Phased arrays, Acoustic detectors), (*Acoustic detectors, Nuclear explosions), Atmosphere, Signal-to-noise ratio, Gain, Acoustic equipment, Signals, Acoustics

An acoustic phased array serves to improve both the signal-to-turbulent-noise ratio and the signal-toacoustic-noise ratio. The improvement in acoustic signal-to-noise ratio is, for isotropic noise, the array gain--which is calculable and is discussed herein. The improvement in the turbulent signal-to-noise ratio cannot be calculated, in view of the unknown correlation of noise in single sensors. However, it is thought likely that this improvement will be at least as much as the acoustic improvement--especially at the higher frequencies of greatest interest for small yields. This Memorandum considers, for simple unshaded square plane arrays, the dependence of array gain upon frequency, azimuth, size of array, number of sensors in the array, and uncertainty in the local velocity of sound. It is shown that an array of 16 sensors at the lattice points of a 1/2 x 1/2 mile square offers a frequency-dependent gain which rises to nearly 10 db at 0.5 cps for any azimuth and for any sound speed in the range of 1000 to 1200 ft/sec. Such an array appears to be suitable for the detection of acoustic signals from atmospheric nuclear blasts. (Author)

17/2. COMMUNICATIONS

AD-623 204 Div. 5/5 ,25/4 ,8/1
CFSTI Prices: HC $1.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
CONTINUOUS FACSIMILE SCANNER EMPLOYING FIBER OPTICS.
Quarterly rept. no. 3, 1 Jan-31 Mar 65,
by Donald A. Pontarelli. 20 Oct 65, 18p. Rept. no. IITRI-A6093-9
Contract DA28 043AMC00164E Proj. IITRI A6093 Task 1P6 20501A448 02 03
Unclassified report

See also AD-615 526.

Descriptors: (*Fiber optics, Facsimile equipment), (*Facsimile equipment, Fiber optics), (*Scanning, Fiber optics), Drives, Electric motors, Phototubes, Optical scanning, Facsimile transmission

The major area of effort this quarter concerned the preparation of the design plan which was submitted at the end of February. Research effort in electronics has been concentrated on the motor drive electronics, signal processing, and consideration of photodetectors. Mechanical engineering has continued the design and fabrication of the copy transport drive which is essential to the further study of the fiber optic scanning system and the optical performance of single layers of fiber. In the latter area, intensive study of the causes of photometric defects in copy exposed through a fiber sheet has indicated the necessity of extensive and detailed study of all aspects of fiber drawing and fiber sheet fabrication. (Author)

AD-623 260 Div. 5/1 ,24/2 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO OKLAHOMA CITY OKLA MILITARY COMMUNICATIONS DEPT
MATRIX CONTROLLED DISPLAY DEVICE, PHASE II.
Interim engineering rept. no. 3, 5 Jul-5 Oct 65, 1 Nov 65, 43p. Contract NObsr89334 Proj. SR080301 Task 9475
Unclassified report

Descriptors: (*Display systems, Optical equipment), (*Information retrieval, Display systems), (*Optical equipment, Photographic recording media), Recording systems, Viewing screens, Thermoplastics, Prisms (Optics), Optical coatings, Indium compounds, Oxides, Collimators, Light, Modulation, Optics, Feasibility studies

The progress in a program to develop a feasibility model of a bright, large screen matrix type display using in-air thermoplastic recording and TIRP (Total Internal Reflection Prism) projection techniques is reported. The modifications needed in the TIRP readout optics to improve display brightness and focus in the feasibility model are discussed. The results of initial recording tests in the 25 x 25 element feasibility model are reported. Well-resolved cells on two mil centers were recorded on thermoplastic by using matrix switching to control the in-air recording process. Recording and display characteristics were strongly dependent on the thermoplastic temperature. At 25C, a display with permanent storage was obtained. At about 100C, it was possible to operate the display in a dynamic mode. Two in-air thermoplastic recording life tests are described. It is shown that thermoplastic has excellent reusability and life. For a display with five minute storage, a 2156 hour life was achieved. A detailed evaluation is given which shows that failure was due to improper operating conditions. Also reported are the results of the initial KPR processing on the 4 x 5 inch glass

substrates for the full scale 2000 line matrix. Solutions implemented to overcome the KPR coating and exposure problems encountered are presented. (Author)

17/2.1 RADIO COMMUNICATIONS

AD-623 140 Div. 5/2 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
THE EVALUATION OF ERROR PROBABILITIES OF DIGITAL SYSTEMS IN THE PRESENCE OF ADDITIVE BECKMANN NOISE.
Master's thesis,
by Robert A. Reinman. Aug 65, 69p. Rept. no. GE/EE/65-19

Unclassified report

Descriptors: (*Communication systems, Digital systems), (*Signal-to-noise ratio, Communication systems), Errors, Probability, Phase shift, Amplitude modulation, Programming (Computers), Data transmission systems

Mathematical expressions for error probabilities of coherent amplitude- and phase-shift keyed digital communication systems in the presence of additive narrowband noise are developed. A digital computer program is developed which evaluates these error probabilities if the noise envelope has a distribution of the form developed by Petr Beckmann in 1964. Beckmann postulated noise as the sum of overlapping impulses of energy whose envelopes are of exponential form. Typical error probabilities as a function of signal-to-noise ratio and number of levels in the system are plotted. (Author)

AD-623 433 Div. 5/2 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
RADIO COMMUNICATIONS WITH ARTIFICIAL SATELLITES OF THE EARTH,
by I. A. Dombrovskii. Aug 65, 21p. Rept. no. TC-931
TT , 65-64330

Unclassified report

(Radiosistemi Svyazi s Iskusstvennymi Sputnikami Zemli. 1963) Trans. of mono. Itogi Nauki i Tekhniki, Moscow, 1964 p12-20, 21-5, 67-70, 268-9. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Radio communication systems, Satellites (Artificial)), (*Space communication systems, Radio communication systems), Wave transmission, Communication satellites (Active), USSR

AD-623 645 Div. 5/2 ,8/3
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
A METHOD FOR ESTIMATING ATMOSPHERIC NOISE AMPLITUDES AND PHASE ERRORS IN QUENCHED HIGHQ RECEIVING CIRCUITS.
Physical sciences research papers,
by E. A. Lewis. Sep 65, 44p. Rept. no. PSRP-136
Proj. 4662 Task 466205
AFCRL , 65-678

Unclassified report

Descriptors: (*Radio receivers, Circuits), (*Noise (Radio), Radio receivers), (*Phase distortion, Radio receivers), (*Atmospherics, Noise (Radio)), Very low frequency, Quenching (Inhibition), Ionospheric propagation, Atmospheric electricity, Fourier analysis

Very narrow-band quenched filters used for studying VLF radio signals differ from conventional narrow-band circuits in that both signal and atmospheric noise impulses cause only brief quasi-sinusoidal outputs instead of a prolonged ringing. The random overlapping of these short noise and signal bursts can cause errors in phase measurements. It is shown that the distribution of phase errors can be calculated from the amplitude distribution of the output noise envelope. The properties of the phase distribution are discussed in detail, the computation required in the general case is illustrated by means of a numerical example. A simple 'time-sequential' method for experimentally obtaining typical amplitude distributions is suggested. (Author)

AD-623 146 **See Fld. 9/5**

AD-623 291 **See Fld. 20/14**

AD-623 334 **See Fld. 4/2**

17/5. INFRARED AND ULTRAVIOLET DETECTION

AD-623 582 **See Fld. 4/2**

17/7. NAVIGATION AND GUIDANCE

AD-623 177 Div. 19/1 ,30/2
CFSTI Prices: HC $4.00 MF $0.75
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
AN INVESTIGATION OF A DIGITAL BEARING COMPUTER FOR A SMALL APERATURE RADIO DIRECTION FINDING SYSTEM.
Technical rept.,
by Hubert L. Grush. Jun 65, 119p. Rept. no. TR-27 ,RRL-280
Contract Nonr183402 Proj. NR371 161

Unclassified report

Descriptors: (*Direction finding, Radio equipment), (*Radio equipment, Direction finding), (*Digital computers, Navigation computers), (*Navigation computers, Direction finding), Radio waves, Angle of arrival, Radiofrequency power, Multipath transmission, Phase measurement

A small aperture radio direction finding system such as a Watson-Watt system is subject to large bearing errors because of the wave interference effect of two waves. By contrast, a large aperture system such as a Wullenweber system exhibits smaller errors under corresponding conditions. This work attempts to develop a practicable means of obtaining accurate bearing information using a small aperture system in the presence of strong wave interference. The technique used is the time averaging of instantaneous bearings. Thus, bearing information may be obtained with a small aperture system by using information available over an extended period of time. The computation of the bearing may be carried out on-line by a small general purpose digital computer. One of the unique features of the digital bearing computer developed here is its capability to adapt to changing input signal conditions. The adaptive capability makes it possible to optimize the averaging process. The process allows estimates of the indicated bearings of both the primary and the interfering waves and their relative strengths to be made. A mathematical model for the relative phase between the two waves is evolved which is not unlike that of the real phase function. The model yields a regular progression of phase plus a random perturbing component. The only restriction placed upon the phase function is that its probability density function be essentially uniform. (Author)

AD-623 303 Div. 19/3 ,8/3 ,1/4
CFSTI Prices: HC $1.00 MF $0.50
SYSTEMS RESEARCH AND DEVELOPMENT SERVICE FEDERAL AVIATION AGENCY WASHINGTON D C
INTERFERENCE TO AIRCRAFT CONDUCTING CATEGORY II INSTRUMENT APPROACHES BY OTHER AIRCRAFT IN VICINITY OF THE AIRPORT.
Technical rept.,
by Nicholas J. Proferes, and Alexander B. Winick. Oct 65, 16p. Rept. no. RD-65-107
Proj. 320 101 01N

Unclassified report

Descriptors: (*Instrument landings, Radio interference), (*Air traffic control terminal areas, Radio interference), (*Radio interference, Instrument landings), (*All-weather aviation, Instrument landings), Navigational aids, Radio signals, Electromagnetic wave reflections, Aircraft antennas, Aircraft, Taxiing, Take-off

Investigations have been made with regard to possible localizer interference to aircraft conducting approaches to Category II minimums (100 feet ceiling - 1/4 mile visibility) by aircraft operating on or about the airport, taking off over the localizer, and aircraft overflying the instrument landing system localizer. (Author)

AD-623 328 Div. 19/4 ,20/3 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
GPL DIV GENERAL PRECISION INC PLEASANTVILLE N Y
RESEARCH AND DEVELOPMENT PROGRAM ON OPTICALLY PUMPED NUCLEAR GYROSCOPE.
Quarterly progress rept. no. 1,
by James H. Simpson. 26 Oct 65, 27p. Rept. no. GPL-A-33-1
Contract NOw65 0577d

Unclassified report

Descriptors: (*Gyroscopes, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Oscillators), (*Pumping (Electronics, Mercury lamps), (*Mercury lamps, Pumping (Electronics)), Mercury isotopes, Rotation, Radiofrequency oscillators, Solid state physics, Phase control devices, Amplifiers, Optics

The design and test of an electrodeless discharge mercury lamp was the chief subject of this portion of the nuclear gyroscope study program. A small, compact lamp and RF oscillator configuration has been found that has a satisfactory output. The mercury spectrum line at 2537A was examined in detail by means of a magnetic scanning technique. The intensity and lineshape of the lamp output were identical with that of the microwave energized electrodeless discharge lamp that was used in previous work with the experimental model of the nuclear gyroscope. The total power input to the new lamp is less than five watts, the input to the microwave lamp was in excess of 80 watts. Work was also begun on the design and construction of a phase stable amplifier using only solid state techniques. (Author)

AD-623 396 Div. 19/2 ,23/5 ,18/7
CFSTI Prices: HC $2.00 MF $0.50
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
THE EFFECTS OF MAP SCALE ON POSITION LOCATION.
Technical rept.,
by Ed Moon Edmonds, and Robert H. Wright. Sep 65, 28p. Rept. no. TR-65-9
Contract DA44 188 AR02 Proj. DA2J024701A712 01

Unclassified report

Rept. on Task LOWENTRY.

Descriptors: (*Map reading, Aviation personnel), (*Maps, Military requirements), (*Navigation charts, Army aircraft), (*Position finding, Map reading), Aerial reconnaissance, Low altitude, Flight paths, Tactical warfare, Army operations, Navigational aids, Scale, Visual perception, Military training

This study was conducted to determine the relationship between field position location and map scale. Two map scales were used--1:25,000 and 1:250,000. Twelve subjects were required to mark their position on a map at each of 12 terrain positions. The task was then repeated, utilizing the other scale map. The error in position location was approximately 10 times greater with the 1:250,000 scale map than with the 1:25,000 scale map. However, a significant scale-by-position interaction was found. It was concluded that maps of 1:100,000 or 1:125,000 scale would best meet the tactical target area requirements of Army aviators, and that the 1:250,000 scale map, with certain format changes, would provide the information necessary for en route tactical navigation over moderate or long distances. (Author)

AD-623 180 See Fld. 8/10

AD-623 306 See Fld. 1/2

17/8. OPTICAL DETECTION

AD-623 587 Div. 6/5 ,12/5 ,2/1
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF ASTRO-PHYSICAL SCIENCES
RESEARCH INTO THE DESIGN FEATURES OF A HIGH-RESOLUTION ULTRAVIOLET SPECTROSCOPIC SATELLITE.
Final rept.,
by Lyman Spitzer,Jr., Kurt A. Dressler, and John B. Rogerson,Jr.. Apr 65, 30p. Contract AF19 604 4972 Proj. 8635 Task 863501
AFCRL , 65-393

Unclassified report

Descriptors: (*Telescopes, Scientific satellites), (*Spectrum analyzers, Telescopes), (*Ultraviolet spectroscopy, Spectrum analyzers), Reflectors, Mirrors, Diffraction gratings, Resolution, Telemeter systems, Reliability (Electronics), Test methods, Photomultipliers, Astrophysics

A chronological account is given of the early investigations of a telescopic satellite. This includes a design study contract for an ultraviolet spectrometer, the fabrication of a 32-inch satellite mirror, and steps taken to develop ground-based data handling equipment. During the term of the contract the design study of a highresolution, ultraviolet spectroscopic satellite resulted in the recommendation of a Cassegrain telescope containing a one-meter concave-grating spectrometer. The design of the spectrometer was based on the availability of (1) a uniform and efficient grating, and (2) efficient photomultiplier tubes with highly uniform cathode areas. The purpose of the laboratory-test program at the Princeton University Observatory (PUO) was the selection and testing of gratings and photomultipliers to establish the availability of components with the desired properties. (Author)

AD-623 685 Div. 6/5 ,24/2 ,22/11
DEFENCE RESEARCH NORTHERN LAB FORT CHURCHILL (MANITOBA)
PARALLACTIC HEIGHT FINDING FOR ROCKET RESEARCH,
by H. J. Koenig, and J. H. Brandy. 3 May 65, 12p.

Unclassified report

Pub. in Canadian Journal of Physics v43 p1435-45 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Height finding, Tracking cameras), (*Photographic techniques, Optical tracking), (*Rocket research, Height finding), (*Tracking cameras, Height finding), Sounding rockets, Trajectories, Projective geometry, Atmospheric sounding

General criteria for the choice of equipment and location of stations for parallactic height finding are discussed and a specific system using K-24 cameras is described. The feature of the system is that the cameras are mounted in such a way that accurately reproducible azimuths and elevations are assured, and consequently predetermined coordinate grids may be used for simple and rapid analysis of picture pairs. A method for constructing these grids is outlined. The construction as well as the subsequent analysis of data can be carried out by relatively unskilled help. The experimental accuracy varies with the requirements and setup of the system, but for the general case of aurora at about 100 km the error with reasonable parallax is of the order of =1 km. In favorable cases, such as with well-defined flashbulb or grenade explosions, the accuracy at a height of 100 km approaches =500 m. (Author)

17/9. RADAR DETECTION

AD-623 277 Div. 6/6
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
RADAR CUMULATIVE DETECTION PROBABILITIES FOR RADIAL AND NONRADIAL TARGET APPROACHES,
by Patricial K. Kirkwood. Sep 65, 49p. Rept. no. RM4643-PR
Contract AF49 638 700

Unclassified report

Rept. on Proj. RAND. See also AD-609 426, AD-276 531.

Descriptors: (*Search radar, Effectiveness), (*Radar targets, Detection), (*Detection, Mathematical prediction), (*Radar ranges, Radar scanning), Aerial targets, Probability, Statistical analysis, Statistical functions, Radar charts, Radar analysis

The cumulative detection probability for a search radar is a function of target approach angle as well as other radar and target parameters. Earlier studies have dealt with radially approaching targets; this one deals with nonradial target approach angles. From the curves in this Memorandum, optimum scan rates and the relationship between cumulative detection probability and normalized range can be determined. Both nonfluctuating and fluctuating target cases (Swerling Cases I and III) are considered. The Fortran program for these calculations is included and can be used to compute cumulative detection probabilities for other target approach angles and scan rates. (Author)

AD-623 371 Div. 6/6 ,30/2 ,8/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
COMPUTER OPTIMIZATION OF A CORNER REFLECTOR FOR ECHO ENHANCEMENT WITH CIRCULAR POLARIZATION.
Rept. on Reactive-Wall Reflectors for 9mm Microwave Operation,
by Jack H. Richmond. 22 Sep 65, 19p. Rept. no. 1968-2
Contract NOw65 0329d

Unclassified report

See also AD-458 004.

Descriptors: (*Optimization, Radar corner reflectors), (*Radar corner reflectors, Optimization), (*Programming (Computers), Radar corner reflectors), Polarization, Radar echo areas, Radar reflections, Dielectrics

When a circularly polarized wave is incident on a trihedral corner reflector, the backscattered wave is circularly polarized with the opposite sense of rotation. However, by coating one of the conducting surfaces of the reflector with dielectric layers, it is possible to obtain a circularly polarized backscatter wave having the same sense of rotation as the incident wave. With the aid of a digital computer, the thicknesses of the dielectric layers can be optimized in an efficient manner to obtain the best performance over the pertinent range of incidence angles. This report includes a computer program for this purpose and describes an optimized four-layer reactive wall. (Author)

AD-623 643 Div. 6/6 ,2/7 ,8/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH NJ
OPTIMUM FREQUENCY STUDY FOR ARMY WEATHER RADAR AND RANGE TRACKING SYSTEM.
Technical rept.,
by Raymond L. Robbiani. Jul 65, 19p. Rept. no. ECOM-2627
Proj. DA1V0 25001A126 Task DA1V0 25001A126 03

Unclassified report

Descriptors: (*X-band, Radar equipment), (*Meteorological radar, X-band), (*Radar tracking, Range finding), Army equipment, Atmospheric sounding, Mobile, Optimization, Artillery

The choice of X-band frequencies for the mobile weather radar and automatic artillery atmospheric sounding set and such considerations as size, weight, rainfall attenuations, rainfall effects on target tracking, and effective data collection periods are discussed. The mobile tactical operational concepts in using the weather radar for maximum effectiveness are included. A comparison is made of detectability and attenuation effects of rain, using various frequencies. (Author)

AD-623 192 See Fld. 9/3

AD-623 330 See Fld. 20/4

AD-623 417 See Fld. 9/1

AD-623 468 See Fld. 4/2

AD-623 545 See Fld. 20/14

AD-623 603 See Fld. 4/2

17/10. SEISMIC DETECTION

AD-623 184 See Fld. 8/11

18/2. ISOTOPES

AD-623 237 See Fld. 16

AD-623 568 See Fld. 13/8

18/3. NUCLEAR EXPLOSIONS

AD-623 087 See Fld. 15/3

18/4. NUCLEAR INSTRUMENTATION

AD-623 384 Div. 20/6
CFSTI Prices: HC $2.00 MF $0.50

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
NUCLEAR TRACK REGISTRATION IN DOSIMETER GLASSES FOR NEUTRON DOSIMETRY IN MIXED RADIATION FIELDS,
by K. Becker. 5 Aug 65, 39p. Rept. no. USNRDL-TR-904
Proj. BuShips SF011 05 11 Task 0503
Unclassified report

Descriptors: (*Dosimeters, Phosphate glass), (*Neutron detectors, Dosimeters), Particle trajectories, Neutrons, Fission neutrons, Luminescence

The fission track detection in fission foil/glass combinations avoids most of the disadvantages of the conventional methods (nuclear track evaluations and activation foils) for integrating neutron measurements. These systems are insensitive to gamma radiation, temperature, climatic and chemical disturbances, easy to evaluate, have no directional dependence, an extended dose and energy range, superior accuracy, etc. The method has been investigated, using different dosimeter glasses, etching conditions, fissionable materials and neutron energies between thermal and 14 MeV. The fission track detection efficiency is 100%, the sensitivity for fissionable metals thicker than ca. 5 microns is 0.000013 tracks/neutron/barn. Simple evaluation techniques and practical applications, mainly for fast neutron personnel dosimetry, are described. (Author)

AD-623 557 Div. 20/6
CFSTI Prices: HC $3.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
NUCLEAR SAFETY,
by Andrew Valiunas, and Bartholomew Poplawski. 22 Oct 65, 65p. Rept. no. ATD-B-65-76
TT, 65-64490
Unclassified report

Annotated bibliography based on Soviet open literature. Report on Surveys of Soviet Scientific and Technical Literature.

Descriptors: (*Health physics instrumentation, Bibliographies), Radiation measurement systems, Shielding, Remote control systems, Safety, Neutron defectors, Alpha particle detectors, Gamma counters, Dosimeters, USSR

An annotated bibliography in presented of Russian papers on the following topics: Neutron detectors; Alpha, beta, and gamma detectors; Dosimeters; Radiation shielding studies; Remote handling and radiation protective devices and studies.

18/8. RADIOACTIVITY

AD-623 640 Div. 20/3 ,14/2 ,14/8 ,17/2 ,+
CFSTI Prices: HC $2.00 MF $0.50
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
RADIATION EFFECTS INFORMATION CENTER MONTHLY ACCESSION LIST. ABSTRACT NO. 29417 TO 29488, PART I, OCTOBER 1, 1965 TO OCTOBER 31, 1965.
10 Nov 65, 32p. Rept. no. reic accession List no. 92
Contract AF33 615 1124
Unclassified report

See also AD-622 790.

Descriptors: (*Radiation damage, Materials), (*Materials, Radiation damage), (*Bibliographies, Radiation damage), Abstracting, Metals, Ceramic materials, Organic materials, Plastics, Polymers, Electronic equipment, Space environmental conditions, Radiation chemistry, Indexes

AD-623 653 Div. 20/3 ,14/2 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
RADIATION EFFECTS INFORMATION CENTER MONTHLY ACCESSION LIST COORDINATE INDEX, PART II. FOR ACCESSION LISTS FROM OCTOBER 1, 1965 TO OCTOBER 31, 1965.
10 Nov 65, 7p.
Unclassified report

Descriptors: (*Radiation damage, Materials), (*Indexes, Radiation damage), (*Materials, Radiation damage), Documentation, Scientific organizations, Subject indexing, Radiation chemistry, Ceramic materials, Metals, Organic materials, Polymers, Electronic equipment, Space environmental conditions, Plastics

AD-623 095 **See Fld. 7/4**

AD-623 169 **See Fld. 20/8**

AD-623 328 **See Fld. 17/7**

AD-623 388 **See Fld. 7/2**

AD-623 485 **See Fld. 20/8**

AD-623 515 **See Fld. 4/2**

18/9. REACTOR ENGINEERING AND OPERATION

AD-623 114 **See Fld. 20/3**

AD-623 509 **See Fld. 20**

AD-623 658 **See Fld. 20/8**

AD-623 659 **See Fld. 20**

19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

AD-623 454 Div. 22/1 ,26/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL AMMUNITION DEPOT CRANE IND
DEVELOPMENT OF A CONTAINER FOR THE MK 54 PHOTOFLASH CARTRIDGES AND MK 18 ARTILLERY AIR BURST SIMULATORS,
Final rept.,
by Charles A. Conner. 22 Sep 65, 21p. Rept. no. RDTR-68
Unclassified report

Descriptors: (*Photoflash cartridges, Containers), (*Training ammunition, Containers), (*Packaging, Ammunition), Artillery, Airburst, Simulators, Handling, Packing materials, Foams, Styrene plastics

This report describes a container that has been developed and evaluated for packaging the Mk 54 Photoflash Cartridges and the Mk 18 Artillery Air Burst Simulators. The recommended container holds twenty six cartridges or simulators, with each cartridge or simulator in a contoured cavity. The container is constructed of expanded beadtype polystyrene plastic foam material that is economical and light in weight. (Author)

AD-623 568 **See Fld. 13/8**

19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-623 242 Div. 22/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ACTIVITIES INVOLVING BLASTING OPERATIONS: REVIEW ARTICLE AND ANNOTATED BIBLIOGRAPHY (USSR).
Rept. no. 3 on AID Work assignment no. 50-E.
30 Mar 64, 24p. Rept. no. AID-U-64-21
TT, 65-64453
Unclassified report

References are taken from Soviet and Soviet-Bloc open-source materials pub. 1963.

Descriptors: (*Blast, Reviews), (*Explosive materials, Bibliographies), Engineering, Mining engineering, Cratering, Dams, USSR

The report is issued in two parts. Part I comprises summary reviews, with illustrations, of three selected Soviet papers which afford considerable insight into the current Soviet state of the art in the engineering uses of explosives. Part II comprises abstracts of 13 papers on various applications of explosives. Cratering techniques, mining, drainage, and techniques of 'confined' charges are among the subjects covered. Abstracts of the papers reviewed in Part I are included in Part II.

AD-623 418 Div. 22/6 ,13/4
CFSTI Prices: HC $2.00 MF $0.50
COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H
EXPLOSIONS AND SNOW.
Cold Regions Science and Engineering pt. 3, Sec. A3a,
by Malcolm Mellor. Jun 65, 42p. Proj. DA1V025001A130 Task DASA02 0462
Unclassified report

Descriptors: (*Snow, Explosion effects), (*Explosion effects, Snow), Civil engineering, Terminal ballistics, Blast, Cratering, Army research, Greenland

This monograph summarizes available information on the response of snow to explosions and on the modification of blase effects by snow.

AD-623 650 Div. 22/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD UNDERWATER EXPLOSIONS DIV
THE RESISTANCE OF HOLLOW GLASS MODELS TO UNDERWATER EXPLOSIONS AT GREAT DEPTHS. I. SPHERES,
by W. H. Faux, and C. R. Niffenegger. 30 Sep 65, 28p. Task NOL 892SP
NOLTR, 65-145
Unclassified report

Descriptors: (*Spheres, Explosion effects), (*Underwater explosions, Explosion effects), (*Glass, Shock resistance), Fracture (Mechanics), Pressure, Tensile properties, Model tests

Hollow glass spheres, 10 in. in diameter, were exposed to explosions of 1-lb charges at a series of depths in the ocean. At a depth of 300 ft, a sphere could not be placed closer than 19 ft from the charge without breaking. At 22,000 ft, the sphere could be as close as about 2.5 ft without damage. At this smaller range, the shock wave peak pressure was estimated to be an order of magnitude greater than at 19 ft, indicating a greatly increased strength of the spheres. (Author)

AD-623 249 **See Fld. 20/8**

19/5. FIRE CONTROL AND BOMBING SYSTEMS

AD-623 090 Div. 22/7 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
CENTER FOR NAVAL ANALYSES FRANKLIN INST PHILADELPHIA PA
THE USE OF SEARCH MEMORIES IN AUTOMATIC TRACKING,
by Henry Bobotek, and Glenn G. Webb. 1965, 65p. Contract Nonr373200
OEG , S-696

Unclassified report

Descriptors: (*Tracking, Automatic), (*Computer logic, Tracking), Track-while-scan, Correlation techniques, Data storage systems, Control sequences, Programming (Computers)

The use of a search memory for correlation in automatic tracking in track-while-scan systems is examined. Several memories, some previously proposed by industry and some suggested here, are compared and the types suitable for single- and multiattempt correlation are identified. An inherent requirement for frequent changing of stored information makes some memories undesirable, and the impact of this requirement should be carefully examined whenever an application of search memory is considered. (Author)

AD-623 305 Div. 22/7 ,18/7
CFSTI Prices: HC $2.00 MF $0.50
TACTICAL AIR COMMAND LANGLEY AFB VA
OPERATIONAL TEST AND EVALUATION OF THE TDU-20/B FOAM TARGET.
Final rept.,
by Karl S. Park. Sep 65, 26p. Rept. no. TAC-TR-64-106

Unclassified report

Descriptors: (*Aerial targets, Towed bodies), Air-to-air, Aerial gunnery, Training devices, Targets, Foams, Expanded plastics, Styrene plastics, Firing tests (Ordnance), Flight testing, Tactical air command, Air Force training

TAC Test 64-106 was conducted to evaluate the overall capability of the TDU-20/B Foam Target under operational conditions of air-to-air gunnery training and to compare the target's qualities with those of the modified five foot dart tested under TAC Test 63-58. The TDU-20/B target was constructed of unreinforced, expanded, polystyrene foam wing panels mounted on an aluminum keel which contained integrated radar reflectors throughout its length, and a weighted, adjustable nose section. The foam panels provided a light, relatively durable, and stable tow target for use with the A/A 37U-15 tow systems mounted on F-100 and F-105 aircraft. The low altitude parachute recovery system was employed on each tow sortie. An epoxy resin compound was used for patching bullet holes and minor damaged areas in the wing panels. It was concluded that the TDU-20/B target can be satisfactorily employed in the standard towing operations during aerial gunnery training missions. The test revealed that the target is stable throughout the airspeed and altitude regime established for air-to-air gunnery training in TAC directives. It has excellent bullet marking characteristics and provides good visual and radar acquisition for aircraft in the dart training pattern. The target cannot be air scored unless a relatively large piece of the target is observed being shot away. Assembling the target is a tedious procedure when compared to building up the modified five foot dart or standard TDU10/B target. The advantages of the TDU-20/B over the modified five foot dart and TDU-10/B do not justify its higher present estimated production cost. (Author)

19/7. ROCKETS

AD-623 137 See Fld. 14/2

AD-623 685 See Fld. 17/8

20. PHYSICS

AD-623 509 Div. 20/9 ,20/5 ,8/2 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
MEASUREMENTS AT HIGH FIELD STRENGTHS ON SUPERCONDUCTING ACCELERATOR CAVITIES,
by H. A. Schwettman, P. B. Wilson, and G. Y. Churilov. Jun 65, 11p. Rept. no. HEPL-392 Contract Nonr22567

Unclassified report

Prepared for presentation at the International Conference on High Energy Accelerators (5th), Frascati (Italy) Sep 65.

Descriptors: (*Particle accelerators, Cavity resonators), (*Cavity resonators, Superconductors), (*Superconductors, Particle accelerators), Electric fields, Cryogenics

High electric field strengths were produced in two superconducting rf cavities with electroplated lead surfaces. The cavities operate near 2856 MHz in modes which are useful for particle acceleration. In a cylindrical cavity operating in the TM010 mode a Q of 2.5 x 10 to the 8th power was obtained at 2K. At a power input into the cavity of 2.5 watts a maximum electric field strength on the axis of about 100,000 volts/cm was produced. Also tested was a resonant section of disk-loaded accelerator structure three periods in length operating in the 2pi/3 mode. In this cavity a maximum electric field of 150, 000 vots/cm was obtained. In both cavities the electric field strength appeared to be limited by electron loading due to field emission. Radiation, which at times exceeded 100 mR/hr, was measured in the vicinity of the cavities. The radiation provides indirect evidence of strong accelerating fields. (Author)

AD-623 659 Div. 20/9 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
A 200 SUPERCONDUCTING RACETRACK MICROTRON,
by B. H. Wiik, H. A. Schwettman, and P. B. Wilson. Sep 65, 15p. Rept. no. HEPL-396 Contract Nonr22567

Unclassified report

Prepared for presentation at the International Conference on High Energy Accelerators (5th), at Frascati (Italy), 9-16 Sep 65.

Descriptors: (*Electron accelerators, Superconductivity), Cyclotrons, Magnets, Focusing, Stability

A race-track microtron is proposed consisting of two 180 degree magnets spaced 2.5 meters apart with a superconducting linac section between. The magnets are two meters in diameter with a homogeneous field of 8 kilogauss. The linac section will operate at 1.2 kmc and provide an energy gain of 10 MeV per turn. The electrons are injected into the microtron at about 12 MeV from a second superconducting accelerator section. The spacing between orbits is 8 cm. Thus vertical and radial focusing can be provided on any orbit by quadrupoles placed in the field-free region between the magnets. The phase error due to the fringing fields of the magnets has been calculated and can be compensated. An energy resolution of 0.001 is expected. Using superconducting linac sections, a beam current of 100 microamps at unity duty cycle is feasible. It is also possible to build the microtron using conventional linac sections. For such a machine a duty cycle greater than one percent is reasonable. (Author)

20/1. ACOUSTICS

AD-623 360 See Fld. 17/1

AD-623 458 See Fld. 20/3

20/2. CRYSTALLOGRAPHY

AD-623 263 Div. 25/2 ,4/2
CFSTI Prices: HC $1.00 MF $0.50
CARBORUNDUM CO NIAGARA FALLS N Y RESEARCH AND DEVELOPMENT DIV
INTERSTITIAL COMPOUNDS OF BORON AND TRANSITION METALS.
Final rept.,
by V. I. Matkovich, J. Economy, and R. F. Giese. Oct 65, 16p. Contract Nonr407500 Proj. NR056 449

Unclassified report

See also AD-423 338, AD-443 487, AD-601 709, AD-608 443, AD-608 444, AD-608 986, AD-613 474.

Descriptors: (*Borides, Crystal structure), (*Transitional elements, Borides), Aluminum compounds, Carbon compounds, Carbon, Boron compounds, Arsenides, Phosphides, Carbides, Yttrium compounds, Silicides, Single crystals, High-temperature research, X-ray diffraction analysis

It has been demonstrated that all of the higher borides can be classified in terms of three simple packing models based on B84 or B12 polyhedral units. The lower borides have also been classified in a similar manner. Among lower borides the structural units are either M2B2 metalboron mixed tetrahedra or all metal tetrahedra. Classification of all lower borides has not been completed and is limited in this report to Fe2B, V3B2 and YB4 structural types. The phases existing in the A1-B-C system have been investigated resulting in two new structural assignments and discovery of a new phase. The discrepancies reported in the alpha boron derivatives have been clarified by studies which demonstrate the existence of multiple stoichiometries within the same structural framework. Various high temperature reactions and, in particular, topotactical transitions in higher borides have been characterized by x-ray diffraction methods. Detailed structure analyses were carried out on C4A1B24, YB12 and YB4. (Author)

AD-623 511 Div. 25/2 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE CRYSTAL PHYSICS LAB
GROWTH AND STUDY OF CERTAIN PEROVSKITESTRUCTURE LASER HOST CRYSTALS.
Semi-annual status rept. for 1 Apr-1 Oct 65. 22 Oct 65, 10p. Contract Nonr396320 Proj. NR017 723

Unclassified report

Descriptors: (*Lasers, Materials), (*Crystal growth, Lasers), (*Crystal lattices, Lasers), Potassium compounds, Magnesium compounds, Fluorides, Impurities, Zone melting, X-ray diffraction analysis, Ultraviolet spectroscopy, Absorption spectra, Barium compounds, Zirconates, Plasma jets

Progress is described for work involving the crystal growth, lattice constant and density determination, and UV absorption edge measurement of magnesium potassium fluoride; and the flux growth and plasma torch growth of barium zirconate.

AD-623 114 See Fld. 20/3

AD-623 121 See Fld. 20/6

AD-623 159 See Fld. 20/12

AD-623 174 See Fld. 20/12

AD-623 339 See Fld. 20/8

AD-623 594 See Fld. 11/6

20/3. ELECTRICITY AND MAGNETISM

AD-623 114 Div. 25/3 ,20/5 ,25/2 ,25/8
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS ORIENTAL SCIENCE LIBRARY
TRANSLATED ABSTRACTS OF ARTICLES AND TITLES OF RESEARCH NOTES APPEARING IN ACTA PHYSICA SINICA, VOL. 20 NO. 4, APRIL 1964.
Aug 65, 10p. Rept. no. Emm-65-20 (a)
Contract AF19 628 5073
TT , 65-64340

Unclassified report

Trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n4 p289-386 1964.

Descriptors: (*Physics, Abstracting), Plasma physics, Ferromagnetism, Cyclotrons, Diodes (Semiconductor), Crystal lattice defects, Molybdenum, Rolling (Metallurgy), Heat transfer, Fluids, Ultrasonic radiation, China

Abstracts are given of articles on: Electromagnetic instabilities of plasma; Ferromagnetic resonance line width due to fluctuation of the exchange interactions; Static analysis of radial oscillation of particles in a helical cyclotron; Figure of merit for alloy-diffused parametric diode; Series resistance and cutoff frequency of a diffused parametric diode; Etch-figures of dislocation lines in molybdenum crystals; Rolling textures in cubically aligned nickel-iron; 'Carrier effect' in spectrographic analysis; Intensifying effect of ultrasonic waves on heat transfer of fluids inside and outside a tube.

AD-623 115 Div. 25/3 ,20/2 ,25/4 ,4/3 ,+
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS ORIENTAL SCIENCE LIBRARY
TRANSLATED ABSTRACTS OF ARTICLES AND TITLES OF RESEARCH NOTES APPEARING IN ACTA PHYSICA SINICA VOL. 20, NO. 5, MAY 1964.
Aug 65, 10p. Rept. no. Emm-65-21 (a)
Contract AF19 628 5073
TT , 65-64341

Unclassified report

Trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n5 p387-482 1964.

Descriptors: (*Physics, Abstracting), Ferromagnetism, Rare earth elements, Resonance scattering, Pions, Electrical properties, Aliphatic compounds, Silicon compounds, Carbides, Interferometers, Monochromatic light, Parabolic antennas, Antenna radiation patterns, China

Abstracts are given of articles on: Effect of rare earth ions on ferromagnetic resonance; Contibution of the cross-diagram in the p-wave resonance of lowenergy pion-neutron scattering; Conductivity, Hall effect, and magnetoresistance effect of InSb at 80-500K; Torque due to the electromagnetic field acting on an oblate spheroidal boundary; Excitation theory and energy transfer in n-alkane molecules; Two new polytypes of silicon carbide-417R and 453 R; Interferometric method of measuring the spectral slit width of a monochromator; Spiral radiator of a rotary parabolic antenna in the decimeter range.

AD-623 122 Div. 25/3 ,8/1
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF ELECTRICAL ENGINEERING
OBSERVATION OF NON-QUASISTATIC PLASMA SURFACE WAVES.
Scientific rept.,
by V. L. Granatstein, and S. P. Schlesinger. 25 Jun 65, 24p. Rept. no. CU-12-65-AF-2461-EE, SR-83
Contract AF19 628 2461 Proj. 4600 Task 460004
AFCRL , 65-556

Unclassified report

Descriptors: (*Plasma medium, Electromagnetic waves), (*Waveguides, Plasma medium), Dipole antennas, Dielectrics, Cavity resonators

Surface waves have been launched from a waveguide onto a glassclad plasma column of moderate size (2 pi R = free space wavelength), in order to test the validity of quasistatic analysis when the small column condition (2 pi R < < free space wavelength) is not satisfied. Resonances were observed in an open microwave cavity, and dispersion of both the circularly-symmetric surface wave and the dipole surface wave has been determined from experimented data. The two waves exhibit regions of backward-wave and forward-wave propagation. The observed positive slope of the dipole mode dispersion curve near signal frequency/axial propagation constant = c is contrary to the predictions of quasistatic analysis, and is shown to agree quantitatively with the results of a more rigorous analysis. (Author)

AD-623 125 Div. 25/3 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
NEW YORK UNIV N Y DIV OF ELECTROMAGNETIC RESEARCH
GEOMETRIC OPTICS AND THE POLARIZATION VECTORS.
Research rept.,
by Robert M. Lewis. Jul 65, 10p. Rept. no. EMp-209
Contract AF19 628 4065 Proj. 4603 Task 460302
AFCRL , 65-612

Unclassified report

Descriptors: (*Electromagnetic fields, Determination), (*Optics, Electromagnetic fields), Polarization, Vector analysis, Partial differential equations

Classical geometrical optics provides simple rules for the construction of electromagnetic fields. However the rules are imcomplete in that the directions of E and H are not completely determined. The usual rules can be derived from an asymptotic solution of Maxwell's equations. This process also yields equations for the direction of E and H. These equations are shown to yield a very simple direction rule which completes the geometrical optics determination of the fields. (Author)

AD-623 218 Div. 25/3
STD RESEARCH CORP PASADENA CALIF
INTERACTION OF A JET OF PLASMA WITH ELECTRIC AND MAGNETIC FIELDS,
by A. N. Kontaratos, and S. T. Demetriades. 19 Nov 63, 26p. Contract AF49 638 1445
AFOSR , 65-1416

Unclassified report

Pub. in Appl. sci. Res. secB v11 p335-60 nd (Copies available only to DDC users).

Descriptors: (*Plasma jets, Electric fields), (*Electric fields, Plasma jets), (*Magnetic fields, Plasma jets), Crossed field devices, Ion accelerators, Momentum, Deflection, Temperature, Thermodynamics, Enthalpy, Magnetohydrodynamics, Argon, Helium

A generalized ohm's law is used to predict changes in the direction and magnitude of the momentum of a stream of plasma in a crossed field accelerator in terms of plasma properties and species temperatures and concentrations. Measurements are reported of accelerator thrust, plasma jet deflection angle, current-voltage characteristics, accelerator inlet momentum, cooling rates and cross-arc power input for argon and helium plasmas. Estimates are given of the mean values of some of the parameters of argon and helium plasma obtained under nonequilibrium conditions. These results are compared with other methods requiring the assumption of LTE. (Author)

AD-623 224 Div. 25/3 ,8/4
ATELIERS DE CONSTRUCTIONS ELECTRIQUES DE CHARLEROI (FRANCE)
THEORY OF SPONTANEOUS OSCILLATIONS IN MERCURY VAPOR HOT-CATHODE DISCHARGE TUBES (THEORIE DES OSCILLATIONS SPONTANEES DANS LES TUBES A VAPEUR DE MERCURE A CATHODE CHAUDE,
by M. Hoyaux, and P. Gans. 1956, 15p. Contract AF61 514 630C

Unclassified report

Pub. in Bulietin de l'Academie Royale de Belgique (Classe des Sciences) p1050-62 10 Nov 1956. (Copies available only to DDC users). Text in French.

Descriptors: (*Plasma oscillations, Discharge tubes), (*Discharge tubes, Plasma oscillations), Plasma sheath, Anodes (Electron tubes), Mercury, Vapors, Voltage, France

The theory of spontaneous oscillations in mercury vapor hot-cathode discharge tubes is described. In this oscilllation three phases may be distinguished: (1) Penetration of the anode sheath; (2) Excess ionization (following the penetration) obeying the law of small variations around a stable equilibrium; (3) Increased voltage drop at the anode (following the disappearance of the excess ionization) according to the theory of hangmuir probes. When the voltage drop at the anode sheath acquires a sufficient value a new penetration occurs and the cycle repeats. New experimental results are in excellent agreement with theory.

AD-623 364 Div. 25/3
BROWN UNIV PROVIDENCE R I
MAXWELL'S EQUATIONS IN A DEFORMED BODY,
by J. B. Walker, A. C. Pipkin, and R. S. Rivlin. 1965, 3p. Contract DA ARO D31 124G484
AROD , 1271:45

Unclassified report

Pub. in Rendiconti della Classedi Scienze Fisiche, Matematiche e Naturali (S8) v38 n5 May 1965 (Copies available only to DDC users).

Descriptors: (*Electromagnetism, Partial differential equations), (*Deformation, Partial differential equations), Electric fields, Magnetic fields, Vector analysis, Magnetic properties

Maxwell's equations are considered for a body which undergoes a static deformation.

AD-623 404 Div. 25/3 ,8/4 ,30/2 ,25/6
CFSTI Prices: HC $5.00 MF $1.00
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
COORDINATED SCIENCE LABORATORY. PROGRESS REPORT.
Quarterly progress rept. for 1 Jun-31 Aug 65.
11 Oct 65, 151p. Contract DA28 043AMC00073E ,Nonr398508 Proj. 20014501B31F

Unclassified report

Research supported in part by NASA, grants NsG376, NsG443, NsG504, NRG14 005 038;

NSF, grants NSF GK36, NSF GE 7809; and AFOSR, grant AFOSR931.65. See also AD-619 504.

Descriptors: (*Physics, Scientific research), (*Computers, Scientific research), Astronautics, Ionosphere, Secondary emission, Bubble chambers, Control systems, Teaching machines, Plasma physics, Superconductors, Electric discharges, Communication systems, Circuits, Vacuum apparatus, Films, Communication theory

Progress is reported in the following fields: ionospheric data, surface and atomic physics, computer applications, computer systems, PLATO, plasma physics, superconductors, high voltage breakdown, thin films, switching systems, communication theory, circuitry.

AD-623 458 Div. 25/3 ,25/1
CFSTI Prices: HC $1.00 MF $0.50
DIAMOND ORDNANCE FUZE LABS WASHINGTON D C
THE DOPPLER EFFECT.
Technical rept.,
by Henry P. Kalmus. 20 Apr 55, 12p. Rept. no. TR-162

Unclassified report

Descriptors: (*Graphics, Doppler effect), (*Doppler effect, Graphics), Acoustics, Electromagnetic waves

The Doppler effect is explained by means of an elementary graphical method. The differences are pointed out which exist if acoustic or electromagnetic fields are considered. (Author)

AD-623 488 Div. 25/3 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
SYRACUSE UNIV N Y DEPT OF ELECTRICAL ENGINEERING
EXPONENTIAL DESCRIBING FUNCTIONS FOR THE ANALYSIS OF TRANSIENT PHENOMENA.
Technical rept.,
by Theodore A. Bickart. Oct 65, 36p. Rept. no. TM-65-4
Contract AF30 602 3538 Proj. 8505 Task 850501
RADC , TR-65-276

Unclassified report

Descriptors: (*Transients, Mathematical analysis), (*Functional analysis, Mapping (Transformations)), Networks, Circuits, Feedback, Algebra, Special functions (Mathematical)

Essentially bounded, square integrable functions over the infinite past are represented by growing exponentials. The memory of a system is associated with the signal representation. The system operation is then characterized by an algebraic input-output relationship. A generic feedback system is treated in detail. The contraction-mapping fixed-point theorem is used to develop conditions for the existence of a solution prior to establishing the approximating system. The concept of practical ultimate boundedness is given as a tool to enlarge the class of systems open to analysis. (Author)

AD-623 530 Div. 25/3 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
GENERAL ELECTRIC RESEARCH LAB SCHENECTADY N Y METALLURGY AND CERAMICS RESEARCH DEPT
RESEARCH TO INVESTIGATE THE MICROSTRUCTURE OF THE INTERNAL MAGNETIC FIELD IN SELECTED MAGNETIC MATERIALS.
Final rept. for 10 Feb 64-10 Aug 65,
by C. D. Graham,Jr., J. J. Becker, and I. S. Jacobs. Sep 65, 75p. Rept. no. 65-GC-0316M
Contract AF33 615 1490 Proj. 7371 Task 737103
ML , TR-65-253

Unclassified report

Descriptors: (*Magnetic materials, Magnetic properties), (*Gadolinium, Magnetic properties), (*Ferromagnetic materials, Magnetic properties), (*Antiferromagnetism, Magnetic materials), Single crystals, Rare earth elements, Anisotropy, Iron alloys, Boron alloys, Germanium alloys, Europium compounds, Tellurium alloys, Cobalt compounds, Iron compounds, Chlorides, Hysteresis, Intermetallic compounds, Microstructure, Crystal lattice defects

The magnetization of a gadolinium single crystal has been measured over a range of fields and temperatures. Magnetic measurements were made on Fe (2-X)Ge and Fe2B. A relatively simple vibrating-sample magnetometer has been constructed for use in this program. A variety of experimental and theoretical work has been carried out on selected antiferromagnetic compounds. The low-temperature parallel susceptibilities of FeF2 and Cr2O3 have been accounted for by the single-ion Van Vleck susceptibility mechanism, thus obviating the need for explanations based on canted spin structures or crystal imperfections. The compounds EuTe and CoC12 have been shown to have nonlinear transverse susceptibilities, and this effect has been shown to arise primarily from the field-dependence of the zero-point spin wave contribution to the free energy. Careful measurements of the magnetization of metamagnetic FeC12 have been made. Hysteresis has been observed in the metamagnetic transitions of FeC12 and FeBr2, and analysis of this problem leads to the conclusion that hysteretic behavior should be expected in all transitions of this type at least under ideal conditions. The high-field measurements on CoC12 showed an anomalously high saturation moment per Co (2+) ion, and this has been explained by an exchange-enhanced g-shift.

AD-623 572 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)
THE EFFECT OF PRESSURE ON THE FERROMAGNETIC PHASE TRANSITION OF EUO,
by Richard Stevenson, and M. C. Robinson. Oct 65, 14p. Contract Nonr301300 Proj. NR018 503

Unclassified report

Descriptors: (*Europium compounds, Oxides), (*Ferromagnetism, Europium compounds), (*Pressure, Ferromagnetism), Phase studies, Compressive properties, Crystal lattices, Transition temperature, Inductance, High-pressure research, Field theory, Molecular properties, Volume, Canada

The compressions of EuO up to 10,000 atm. have been measured at 296 K, 82 K and 4.2 K. The shift in temperature of the ferromagnetic phase transition has been measured as a function of pressure, by measuring the mutual inductance of a coil containing the solid. The transition occurs at about 72 K at 10,000 atm., which is about 5 K higher than the transition at atmospheric pressure. The results tend to substantiate a molecular field model for EuO proposed by McGuire and Shafer (J. Appl. Phys. 35:984, (1964)). An estimate is made of the variation of the exchange interaction parameter with lattice parameter; delta J/delta a = -0.62 K/A, where J refers to interactions between nearest magnetic neighbours. (Author)

AD-623 573 Div. 25/3 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)
COMPRESSIONS OF COCL2, FECL2, NICL2, EUS, MNF2, RBMNF3 AND NIF2.
Technical rept.,
by Richard Stevenson. Nov 65, 7p. Contract Nonr301300 Proj. NR018 503

Unclassified report

Descriptors: (*Compressive properties, Ferromagnetic materials), (*Antiferromagnetism, Compressive properties), Phase studies, Low-temperature research, High-pressure research, Volume, Pressure, Cobalt compounds, Iron compounds, Nickel compounds, Chlorides, Europium compounds, Sulfides, Manganese compounds, Rubidium compounds, Fluorides, Canada, Cryogenics

Compressions to 10,000 atm. have been measured at room temperature, liquid air temperature, and liquid helium temperature for CoCl2, FeCl2, NiCl2, EuS, MnF2, RbMnF3 and NiF2. (Author)

AD-623 620 Div. 25/3 ,2/7 ,12/1
LINCOLN LAB MASS INST OF TECH LEXINGTON
PROPAGATION AND SCATTERING IN PLASMAS,
by Ralph D. Kodis. 23 Feb 65, 10p.

Unclassified report

Pub. in Proceedings of IEEE v53 n8 p1016-24 Aug 1965 (Copies not available to DDC or Clearinghouse customers). Research supported by ARPA.

Descriptors: (*Plasma medium, Electromagnetic waves), (*Electromagnetic waves, Propagation), Scattering, Dielectrics, Continuum mechanics, Integrals, Magnetic properties, Ionosphere, Atmosphere entry, Wake

Some of the physical assumptions are discussed that underlie the mathematical model of a temperate plasma as a continuous medium. On the basis of these assumptions, the tensor permittivity of a locally homogeneous electron plasma in a uniform magnetic field is derived and incorporated in the usual Helmholtz integral for the scattering of an electromagnetic plane wave by a dielectric region. By extending this integral to a plasma with random spacetime fluctuations, formulas are derived for the coherent and incoherent components of the power scattered per unit solid angle in any direction. On the basis of these formulas, a summary account is given of the various attempts that have been made to explain the observed scattering from laboratory plasmas, from the ionosphere, and from the turbulent wakes associated with hypersonic re-entry of large terrestrial vehicles into the earth's atmosphere. (Author)

AD-623 164 See Fld. 20/12

AD-623 240 See Fld. 8/14

AD-623 302 See Fld. 9/1

AD-623 337 See Fld. 20/12

AD-623 340 See Fld. 20/12

AD-623 341 See Fld. 7/4

AD-623 363 See Fld. 20/12

AD-623 397 See Fld. 20/12

AD-623 407 See Fld. 9/5

AD-623 480 See Fld. 20/8

AD-623 559 See Fld. 9/5

AD-623 570 See Fld. 10

AD-623 571 See Fld. 11/6

AD-623 574 See Fld. 10

AD-623 606 See Fld. 4/2

AD-623 648 See Fld. 20/14

AD-623 655 See Fld. 20/14

AD-623 681 See Fld. 8/14

20/4. FLUID MECHANICS

AD-623 167 Div. 9/6
CFSTI Prices: HC $2.00 MF $0.50
NORTH AMERICAN AVIATION INC LOS ANGELES CALIF
SUPERSONIC LIFT SOLUTIONS OBTAINED BY EXTENDING THE SIMPLE LINEARIZED CONICAL FLOW THEORY,
by T. F. Coleman. 31 Oct 47, 28p. Rept. no. AL-311 ,CF-783
Unclassified report

Descriptors: (*Wings, Aerodynamic characteristics), (*Trailing control surfaces, Lift:), (*Lift, Mathematical analysis), Supersonic flow, Subsonic flow, Flat plate models, Delta wings, Theory, Linear systems, Rectangular bodies, Conical bodies

Results of the linearized conical supersonic flow theory for flat plate wings are extended to the treatment of certain planforms which cannot be solved by the simple methods of superposition previously described. The method described in the report is applicable to wings with subsonic trailing edges (within certain limitations) and to regions in which the flow is affected by more than one disturbance. Solutions are obtained by superposing conical flow fields resulting from elementary wings with certain special properties, to the basic wings required; this superposition is accomplished by integrating the contribution of an infinite number of such elementary wings, plus the contributions from the basic wings obtained in the usual manner. The elementary wings used are chosen in such a way that the boundary conditions of the wing to be solved are satisfied by the integrated solution. The method is applied to obtain expressions for the pressure distributions on a low aspect ratio rectangular wing, a triangular wing with cut-off wing tips, and a diamond wing. (Author)

AD-623 168 Div. 9/6
CFSTI Prices: HC $1.00 MF $0.50
GENERAL DYNAMICS/FORT WORTH TEX
DETERMINATION OF UPWASH AROUND A BODY OF REVOLUTION AT SUPERSONIC VELOCITIES,
by L. Beskin. 27 May 46, 17p. Rept. no. cvac-DEVF-Memo-BB-6,APL/JHU/CM-251
Contract NOrd9038
Unclassified report

Prepared in cooperation with Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab. Contract NOrd7386.

Descriptors: (*Bodies of revolution, Supersonic characteristics), (*Supersonic flow, Bodies of revolution), Downwash, Fuselages, Conical bodies, Cylindrical bodies, Numerical analysis, Lift

The method of analysis presented is a straightforward application of the formulas for the potential flow around bodies of revolutions at supersonic velocities which have been established by H. S. Tsien (Journal of the Aeronautical Sciences, October 1938: Supersonic flow over an inclined body of revolution).

AD-623 298 Div. 9/6
CFSTI Prices: HC $3.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
AN IBM 7090 PROGRAM FOR COMPUTING TWODIMENSIONAL AND AXIALLY-SYMMETRIC SUPERSONIC FLOW OF AN IDEAL GAS. SUPPLEMENT I. SUBROUTINES FOR COMPUTING THE SHOCK AND FREE STREAMLINE DIVIDING TWO REGIONS OF NONUNIFORM SUPERSONIC FLOW,
by F. Edward Ehlers. Aug 65, 53p. Rept. no. MN-422 ,D1-82-0462
Unclassified report

Also available from the author.

Descriptors: (*Supersonic flow, Programming (Computers)), (*Programming (Computers), Supersonic flow), Twodimensional flow, Axially symmetric flow, Shock waves, Programming languages, Wedges

Methods for computing a shock wave and also a free streamline dividing two regions of isoenergetic supersonic flow are explained with computed examples of both twodimensional and axially-symmetric flows. The subroutines as coded in FORTRAN language for the IBM 7094 are listed and the procedures for their use are described. (Author)

AD-623 323 Div. 9/7
CFSTI Prices: HC $4.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK ORDANANCE RESEARCH LAB
BODY OF REVOLUTION WITH FINS.
Technical memo.,
by N. M. Burstein. 15 Sep 65, 127p. Rept. no. TM-504.2461-07
Contract NOw65 0123d
Unclassified report

Descriptors: (*Boundary layer, Bodies of revolution), (*Bodies of revolution, Boundary layer), (*Fins, Aerodynamic characteristics), Velocity, Vortices, Trailing control surfaces, Mathematical analysis, Slender bodies, Propellers (Aerial)

The properties of the flow near the trailing edge of a body of revolution with fins were investigated experimentally and compared with predicted values based on existing theories. Experimental work included measurements with a hot-wire anemometer to determine some statistical properties of the randomly fluctuating velocity field. These properties include correlation functions and their related power-spectral densities and steady mean values and root-mean-square values of the velocity fluctuations. Further properties of the flow field were established with a pitot-static tube and a vorticity meter that measured streamwise vorticity arising from the fin-and-body configuration. Measurements were also made for the body with a propeller located at 0.97 per cent of the body length from the nose. The results obtained establish that the aft fins are the major cause of the radial and circumferential fluctuation of the mean velocity, which give rise to unsteady forces in the propulsor. (Author)

AD-623 326 Div. 9/1 ,9/6
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS
ON THE FLOW PAST A SEMI-INFINITE FLAT PLATE,
by Carl Kaplan. Jun 65, 31p. Contract AF49 638 496
AFOSR , 65-0975
Unclassified report

Descriptors: (*Flat plate models, Fluid flow), Gas flow, Two-dimensional flow, Partial differential equations, Incompressible flow, Viscosity, Boundary layer, Thickness, Functions

The Navier-Stokes equations for two-dimensional flow are linearized around a dominant uniform stream velocity. The concept of field modes in fluid mechanics is then applied to the often-treated and well-known problem of viscous incompressible flow over a semi-infinite flat plate fixed in an unbounded uniform stream. One of the results that emerges from this novel treatment of an old problem is that the usual notion of a displacement thickness leads naturally to a displacement boundary beyond which the streamlines of the viscous flow past the flat plate are indistinguishable from the streamlines due to potential flow past this boundary. (Author)

AD-623 330 Div. 9/6 ,2/7 ,6/6 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE WAKE OF A LARGE BODY MOVING IN THE IONOSPHERE,
by Phyllis Greifinger. Sep 65, 48p. Rept. no. RM-3808-ARPA
Contract SD79 Proj. arpa order 189 61
Unclassified report

Descriptors: (*Wake, Radar reflections), (*Ionosphere, Electron density), (*Radar reflections, Ionosphere), Guided missiles, Ions, Numerical analysis, Ionospheric distrubances, Aerodynamic configurations, Perturbation theory

The memorandum investigates the steady-state perturbations of the ion and electron densities caused by a large-radius conducting disk moving through the ionosphere at a speed intermediate to the ion and electron thermal speeds. An approximation to the electron density in the region close behind the body is found by solving Poisson's equation, neglecting the ion density. For larger distances behind the body where the ion and electron densities are almost equal, an expression for the Fourier transform of the perturbed ion density is obtained, taking account of the ion thermal motion and scattering in the electric and magnetic fields, but neglecting collisions. The transform is inverted to obtain an approximate expression for the space dependence of the perturbation at large distances. Finally, the solutions for different body shapes and boundary conditions are discussed. (Author)

AD-623 455 Div. 9/1 ,30/3
CFSTI Prices: HC $7.00 MF $1.75
HARRY DIAMOND LABS WASHINGTON D C
PROCEEDINGS OF THE FLUID AMPLIFICATION SYMPOSIUM, 26, 27, AND 28 OCTOBER 1965. VOLUME I.
Oct 65, 356p. Proj. DA 1P010501A001 ,HDL 31100
Unclassified report

Descriptors: (*Amplifiers, Fluid flow), (*Symposia, Amplifiers), (*Fluid flow, Amplifiers), Jets, Nozzles, Pneumatic systems, Two-dimensional flow, Compressible flow, Jet mixing flow, Reports, Stability, Fluid dynamic properties, Theory, Control systems, Vortices

Contents: Theoretical study of a convergent nozzle and free jet flow, experimental study of a convergent nozzle and free jet flow, pressure recovery characteristics of compressible two-dimensional free jet flows, the flow of turbulent incompressible two-dimensional jets over ventilated cavities, flow stability for two-dimensional cusp devices, new comprehensive studies on sudden enlargements, spreading rates of compressible two-dimensional reattaching jets upstream of reattachment, calculation of the separation of a jet attached to a convex wall, analysis of the steadyflow pneumatic resistance of parallel capillaries, similarity relations and characterization of pure fluid elements, dynamic similarity analysis of compressible viscous fluid pipe flow, a definition of the mechanical

potential necessary to a fluid circuit theory, on the future of dynamic analysis of fluid systems, an approach to broad band fluid amplification at acoustic frequencies, predicting closed loop stability of fluid amplifiers from frequency response measurements, on the dynamical characteristics of fluid amplifiers and elements, impedance matching in bistable and proportional fluid amplifiers through the use of a vortex vent.

AD-623 456 Div. 9/1 ,30/3
CFSTI Prices: HC $7.00 MF $1.75
HARRY DIAMOND LABS WASHINGTON D C
PROCEEDINGS OF THE FLUID AMPLIFICATION SYMPOSIUM, 26, 27, AND 28 OCTOBER 1965. VOLUME II.
Oct 65, 395p. Proj. DA 1P010501A001 ,HDL 31100

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Amplifiers, Fluid flow), (*Symoposia, Amplifiers), (*Fluid flow, Amplifiers), Oscillators, Pneumatic systems, Fluid dynamic properties, Jets, Vortices, Performance (Engineering), Flow visualization, Digital systems, Control systems, Theory, Computer logic

Contents: A temperature-insensitive oscillator and a pressure-controlled oscillator, development of a pressure controlled oscillator for fm systems, fluid dynamic effects of liquids in elastic tubes, transient response of a fluid line with and without bleeds, experiment and theory of acoustically controlled fluid switches, some influences of turbulence on the noise of proportional fluid amplifiers, effect of receiver design on amplifier performance and jet profile of a proportional fluid amplifier, steady and transient behavior of a bistable amplifier with a latching vortex, performance characteristics of vortex amplifiers, fluid vortex amplifier optimization, characteristics of a vortex device and the vortex-breakdown phenomenon, experimental profiles of velocity components and radial pressure distribution in a vortex contained in a short cylindrical chamber, a theoretical and experimental investigation of the vortexsink angular rate sensor, flow studies in a vortex rate sensor, photoviscous flow visualization in fluid state devices, turbulence amplifier for integrated two-dimensional fabrication, digital data handling speeds with pure fluid (pneumatic circuits).

AD-623 457 Div. 9/1 ,30/3
CFSTI Prices: HC $7.00 MF $1.75
HARRY DIAMOND LABS WASHINGTON D C
PROCEEDINGS OF THE FLUID AMPLIFICATION SYMPOSIUM 26, 27, AND 28 OCTOBER 1965. VOLUME III.
Oct 65, 340p. Proj. DA 1P010501A001 ,HDL 31100

Unclassified report

Descriptors: (*Amplifiers, Fluid flow), (*Symposia, Amplifiers), (*Fluid flow, Amplifiers), Pneumatic systems, Control systems, Digital-to-analog converter, Jets, Computer logic, Attitude control systems, Guided missiles, Digital systems, Temperature control, Timing devices, Respirators, Valves, Computers

Contents: Experimental study of a proportional fluid amplifier, bistable fluid jet amplifier with low sensitivity to receiver reverse flow, development of a pure fluid norgate and a norlogic binary to decimal converter, a pneumatic tape-reader, fluid state hybrid control systems, a fluid state digital to analog converter, a digital-proportional fluid amplifier for a missile control system, a development report on a fluid amplifier attitude control valve system, application of fluerics to missile attitude control, a second generation of fluid system applications, a fluid state absolute pressure ratio computer, a temperature control system using flueric components, fluid timer development, the use of a fluid amplifier in an intermittent stream release valve for high altitude research, an evaluation of a fluid amplifier, face mask respirator, a fluid operated diesel locomotive transition control unit, area experience in moderate volume fabrication of pure fluid devices.

AD-623 460 Div. 9/7
CFSTI Prices: HC $2.00 MF $0.50
VON KARMAN INST FOR FLUID DYNAMICS RHODE-SAINT-GENESE (BELGIUM)
EFFECT OF MACH NUMBER ON STREAMWISE VORTICES IN LAMINAR REATTACHING FLOWS.
Technical note,
by Jean J. Ginoux. Jul 65, 34p. Rept. no. TN-26 ,TR-1
Contract AF EOAR11 65

Unclassified report

Descriptors: (*Vortices, Velocity), (*Laminar flow, Vortices), Two-dimensional flow, Wind tunnels, Supersonic flow, Hypersonic flow, Boundary layer, Thickness, Model tests, Belgium

An experimental investigation was made in various supersonic and hypersonic wind tunnels to determine the effect of Mach number on the existence of streamwise vortices in the reattachment region of the flow over twodimensional backward facing steps. It was found that the phenomenon previously observed at M = 2.21 remained unchanged over a Mach number range of 1.5 to 7.0. The ratio of the wave length of the vortices to the boundary layer thickness at separation varied slightly with free stream Mach number, with a maximum at about M = 3. (Author)

AD-623 553 Div. 9/6
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV
MASS TRANSFER IN THE LOW REYNOLDS NUMBER VISCOUS LAYER AROUND THE FORWARD REGION OF A HYPERSONIC VEHICLE.
Technical information series,
by L. Goldberg, and S. M. Scala. Jul 65, 44p. Rept. no. R65SD27

Unclassified report

Descriptors: (*Reentry vehicles, Hypersonic flow), (*Atmosphere entry, Transport properties), Heat transfer, Boundary layer, Friction, Lift, Trajectories

The paper describes a theoretical investigation of the effect of mass transfer into the hypersonic low Reynolds number viscous layer upon the heat transfer rate and skin friction. New results have been obtained and correlated as a function of the Reynolds number. The range of applicability of the present fluid dynamic model is also discussed and comparisons are drawn with earlier work, both theoretical and experimental. (Author)

AD-623 563 Div. 9/2 ,9/6 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE COMPRESSIBLE BOUNDARY LAYER,
by George B. W. Young, and Earl Janssen. 1 Jun 51, 41p. Rept. no. P-214

Unclassified report

Descriptors: (*Laminar boundary layer, Equations), (*Compressible flow, Thermodynamics), Integrals, Heat transfer, Viscosity, Aerodynamic heating, Thermal insulation

The laminar boundary layer equations in integral form are solved on the mechanical differential analyzer. The method of analysis permits the use of the best known variation of the air properties with temperature. Solutions are obtained for Mach numbers ranging from incompressible speeds to the hypersonic regime at ambient temperatures of 100, 400 and 800R for both insulated plate and heat transfer cases. From these results an approximate design procedure for the calculation of the characteristics of both the laminar and turbulent boundary layers is obtained and presented as an aid to missile designers. (Author)

AD-623 565 Div. 9/1 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
FLUERICS (FLUID AMPLIFICATION). 9. FLUID DIGITAL LOGIC ELEMENTS AND CIRCUITS,
by Joseph M. Iseman. 16 Aug 65, 47p. Rept. no. TR-1302 ,TR-1114 superseded
Proj. DA 1P10501A001 ,HDL 31100

Unclassified report

Descriptors: (*Amplifiers, Fluid flow), (*Computer logic, Fluid flow), Digital systems, Input-output devices, Control systems, Counting methods

At the heart of any digital system are the logic elements. The algebra governing these devices, the AND, OR, NAND, NOR, flip-flop and others, has been established and is well known in electronic control and computer systems. There are fluid circuits that can satisfy the same algebraic rules for any digital logic system. A systemized treatment of the basic wall-effect fluid combinatorial and sequential elements as well as some systems studied to date is presented. (Author)

AD-623 569 Div. 9/1 ,24/2
CFSTI Prices: HC $3.00 MF $0.50
TECHNISCHE HOCHSCHULE DARMSTADT (GERMANY)
SIMPLE METHODS AND INSTRUMENTATION FOR VERY SHORT EXPOSURE, HIGH REPETITION RATE KINEMATOGRAPHY IN CONJUNCTION WITH FLUID ATOMIZATION STUDIES.
Final rept.,
by F. N. Scheubel, A. Fritzsche, and H. Wendt.
Aug 65, 51p. Contract AF61 052 651
AFCRL , 65-774

Unclassified report

Descriptors: (*Atomization, Motion picture photography), (*Flow visualization, Atomization), (*Motion picture photography, Atomization), (*Highspeed photography, Atomization), Light pulses, Capacitors, Electrical discharges, Variable resistors, Rotating-drum cameras, Electronic triggers, Jets, Boundary layer, Instrumentation, West Germany

The high voltage discharge of a pulsed light source with coaxial capacitor and extremely low inductance (Fischer-Nanolite) was employed successfully for ultra-short-time exposure of rapidly changing phenomena in the boundary layer of two-phase-flow. Design and operation of the electronic trigger-unit controlling high voltage discharge and shot series limitation are described. The high speed cameras and the lighting device developed in this way were used to investigate the atomization of liquids. In order to study the disintegration itself it is necessary to get distinct exposures of particles in the order of some hundredth of a millimeter and velocities of more than one hundred meters/second. A simple calculation indicates that exposure times in the nanosecond range are required.

AD-623 589 Div. 9/4 CFSTI PricesMF $2.50
OFFICE OF NAVAL RESEARCH WASHINGTON D C
THE COLLECTED PAPERS OF SIR THOMAS HAVELOCK ON HYDRODYNAMICS,
by C. Wigley. 1965, 637p. Rept. no. ONR/ACR-103

Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $4.50 as D-210.15:ACR/103.

Descriptors: (*Hydrodynamics, Reviews), Ships, Wake, Drag, Water waves, Motion, Fluid dynamic properties

A compilation of 60 papers on hydrodynamics is presented.

AD-623 607 Div. 9/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE EFFECT OF THE MOLECULAR MODEL ON RAREFIED GAS FLOWS,
by D. Roger Willis. Nov 65, 44p. Rept. no. RM-4638-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Gas flow, Molecular properties), (*Superaerodynamics, Models (Simulations)), Iterative methods, Separation, Moments, Differential equations, Aerodynamic characteristics, Three-dimensional flow

The memorandum presents an analysis of the effect of molecules with infinite collision cross section upon the methods of obtaining solutions to the Boltzmann equation in the nearly free molecular regime. It is found that Knudsen iteration is satisfactory for computing physically meaningful moments of the distribution function for threedimensional flows about isolated bodies. For onedimensional (parallel-plate) problems a new iterative method is proposed. It is found that certain of the moments (e.g., the mean velocity perturbations) will have the form (1/Kn) to the (S-1)/ (S+1) power for molecules that repel each other with a force proportional to the inverse-S power of their separation. For flows about two-dimensional isolated bodies, significant questions appear to be still open. The effect of using the correct quantum collision cross section also requires further study. (Author)

AD-623 118 **See Fld. 13/7**

AD-623 136 **See Fld. 8/10**

AD-623 188 **See Fld. 14/2**

AD-623 199 **See Fld. 20/13**

AD-623 255 **See Fld. 8/10**

AD-623 257 **See Fld. 8/10**

AD-623 278 **See Fld. 14/2**

AD-623 331 **See Fld. 21/2**

AD-623 405 **See Fld. 12/1**

AD-623 617 **See Fld. 20/13**

20/6. OPTICS

AD-623 121 Div. 25/4 ,25/2 ,14/2
CFSTI Prices: HC $2.00 MF $0.50
MITHRAS INC CAMBRIDGE MASS
TRANSITION METALS IN LAALO3.
Scientific rept.,
by Charles S. Naiman, Jack Schwartz, and Arthur Linz. Jul 65, 31p. Rept. no. MC-64-102-R1, SR-1
Contract AF19 628 4006 Proj. 4600 Task 460003
AFCRL , 65-619

Unclassified report

Descriptors: (*Lanthanum compounds, Aluminates), (*Aluminates, Impurities), Chromium, Cobalt, Absorption, Optical properties, Paramagnetic resonance, Atomic energy levels, Symmetry (Crystallography), Lasers, Ceramic materials

Optical absorption and EPR studies have been made of Cr and Co in LaAlO3 grown by flame fusion. Crystal field values have been established as follows: Dq/B = 3.18 for Cr (3+), 0.965 for Co (2+), and 3.08 for Co (3+) in LaAlO3. Local site symmetries for the two dopants, as observed by EPR, are discussed. (Author)

AD-623 139 Div. 25/4
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
DESIGN CONSTRUCTION, AND STUDY OF A METAL TUBE ARII LASER.
Master's thesis,
by Edward D. Aitken, and John W. Dettmer. Aug 65, 73p. Rept. no. GE/EE/65-1

Unclassified report

Descriptors: (*Lasers, Argon), (*Argon, Lasers), Ions, Helium group gases, Metals, Pipes, Optics

To provide a better method of cooling an argon ion laser, the arc-tube was constructed by alternately stacking 52 copper discs (1/8 in. long with a 3/32 in. hole in the center) and 53 viton O-rings. For this design the optimum fill-pressure was experimentally determined to be 0.24 torr and the voltage gradient in the arc-tube was 6.8 volts/cm. Over the discharge current range of 7.5 to 17.5 amperes, the power output varied as I (3.5). By shorting groups of discs together, it was found that metal tube lasers can be constructed of segments with length-to-bore ratios of up to 11.33. (Author)

AD-623 141 Div. 25/4
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
POLARIZATION OF INFRARED RADIATION BY BREWSTER ANGLE REFLECTION FROM A GERMANIUM SURFACE.
Master's thesis,
by George E. Schropp. Aug 65, 84p. Rept. no. GE/EE/65-23

Unclassified report

Descriptors: (*Infrared radiation, Polarization), (*Germanium, Optical properties), Dielectrics, Surfaces, Refractive index, Reflection, Mathematical models, Polariscopes

A study was made of the polarization of the reflected component of infrared energy that is incident at the Brewster angle upon the plane surface of a germanium sample. The principal surfaces of the germanium sample are optically flat and are parallel to within 5 seconds of arc. A polariscope, designed to fit the Perkin-Elmer Model 13 Infrared Spectrophotometer, is fabricated with provision for the independent adjustment of the angle of incidence of both the polarizer and the analyzer along with the independent freedom of rotation of the analyzer to permit crossing the two stages. The calculated Fresnel curves are verified with experimental data for 2.1 microns, and the polarization versus wavelength is measured and found to be constant for 3.4, 5.0, and 8.3 microns. (Author)

AD-623 264 Div. 25/4 ,4/3 ,14/6
CFSTI Prices: HC $3.00 MF $0.50
GENERAL TELEPHONE AND ELECTRONICS LABS INC BAYSIDE N Y
CHELATE LASERS.
Annual technical summary rept. on Proj. DEFENDER, 1 Oct 64-30 Sep 65,
by A. Lempicki, H. Samelson, and C. Brecher.
30 Oct 65, 52p. Rept. no. TR-65-052.11
Contract Nonr413400 Proj. arpa order 306 62

Unclassified report

See also AD-450 627.

Descriptors: (*Lasers, Materials), (*Complex compounds, Lasers), (*Europium compounds, Complex compounds), Liquids, Solutions, Fluorescence, Excitation, Absorption spectrum, Solvents, Emissivity, Dissociation, Chemical equilibrium, Ketones, Molecular properties

The investigation of chelate lasers has as its objective the evaluation of the potentialities of liquid lasers and the analysis and improvement of their performance. Toward this end, the work was designed to proceed along two parallel and complementary lines: an investigation of the chemical properties of the materials, in terms of the requirements for laser action; and an investigation of the physical properties of the chelate laser itself, in terms of the design and improvement of the laser cavity and associated equipment. The report summarizes previous work and describes in detail the progress on these lines in the past year. A full-length paper entitled 'Spectroscopy and coordination chemistry of europium chelate solutions: concentration and solvent effects' is included as an appendix.

AD-623 309 Div. 25/4 ,14/2
CFSTI Prices: HC $3.00 MF $0.75
CORNING GLASS WORKS N Y
GLASS LASER RESEARCH.
Semiannual technical rept. on Proj. DEFENDER, Dec 64-15 Jul 65,
by R. D. Maurer, M. E. Vance, G. E. Stong, N. F. Borrelli, and S. D. Sims. 15 Aug 65, 91p. Contract Nonr383300 Proj. arpa order306 62

Unclassified report

See also AD-612 964.

Descriptors: (*Lasers, Materials), (*Glass, Lasers), Ultraviolet radiation, Radiation damage, Discoloration, Additives, Cerium compounds, Oxides, Atomic energy levels, Gain, Amplifiers, Fluorescence, Probes (Electromagnetic), Refraction

The report presents additional data on the properties of glass used in lasers as well as operating characteristics of glass lasers. The effect of intense ultraviolet radiation is shown to decrease the output of glass lasers much more than can be accounted for the decrease in fluorescence intensity or absorption of pump light. Comprehensive threshold and output data are given for several lasers of Code 0580 glass. These data can be approximately described by the theory of Miles and Goldstein using an internal oscillator loss only slightly higher than the measured static loss in the glass. Gain data of a glass laser amplifier show the difference between a glass laser probe and a narrow band probe with respect to averaging over the fluorescence line. Finally, quantitative measurements of the birefrigence following pumping are given. (Author)

AD-623 370 Div. 25/4
CFSTI Prices: HC $7.00 MF $1.75
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF PHYSICAL SCIENCES LAB
ABSORPTION COEFFICIENTS OF HEATED AIR: A COMPILATION TO 24,000K, VOLUME II.
Final rept. for 1 Apr 64-30 Jul 65,
by D. R. Churchill, B. H. Armstrong, and K. G. Mueller. Oct 65, 393p. Rept. no. 4-77-65-1
Contract AF29 601 6320 Proj. 5710 Task 07 003
AFWL , TR-65-132 V2

Unclassified report

See also AD-622 797.

Descriptors: (*Air, Absorption spectrum), (*Photons, Absorption), (*Absorption spectrum, Air), Thermal properties, Density, Band spectrum, Thermal radiation, Tables

An extensive tabulation of absorption coefficients of heated air was carried out with the aid of several large digital computer programs. These tables supersede the previous ones computed at Lockheed by Meyerott, Sokoloff, and Nicholls in 1959. Tables are presented for temperatures at every 1000K between 1000K and 24,000K and for eight densities between ten times normal atmospheric to 0.000001 times normal. Absorption coefficients are individually listed for each of 14 contributing absorbers. The photon energy range is 0.6 -- 10.7 eV with a partition interval of 0.1 eV. (Author)

AD-623 391 Div. 25/4 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y
OPTICAL LENS SYSTEMS DESIGN FORMULAE FOR HIGH SPEED COMPUTERS.
Quarterly status rept. no. 5,
by Robert E. Hopkins. 30 Jun 65, 4p. Contract DA30 069AMC534A

Unclassified report

See also AD-614 659 and AD-614 901.

Descriptors: (*Lenses, Design), (*Programming (Computers), Lenses), Optics industry, Data processing systems

Flair was developed further. Flair is an automatic lens system correction and evaluation program that permits simultaneous correction and minimization of the members of a set of 35 image errors derived from 3d order theory, ray tracing, and differential ray tracing. Options are provided for minimization of the mean square wavefront deformation on axis and at the 2 field points, and for minimization of the paraxial angles of incidence. A third option permits the user to define a set of rays whose deviations he wishes to minimize. Upon completion of a design run, the program prepares and prints a table of geometric optical frequency response data for the axial image and for the images at the 0.7 zone and edge of the field.

AD-623 392 Div. 25/4 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y
OPTICAL LENS SYSTEMS DESIGN FORMULAE FOR HIGH SPEED COMPUTERS.
Quarterly status rept. no. 6,
by Robert E. Hopkins. 30 Sep 65, 4p. Contract DA30 069AMC534A

Unclassified report

Descriptors: (*Lenses, Design), (*Programming (Computers), Lenses), Glass, Numerical methods + procedures, Matrix algebra

The Flair program was segmented into 3 parts, chain 1 including automatic correction features and chain 3 output features. An extensive study is being made of the Heliar type lens, three programs turning out different designs for different glasses; the choice of glass does not appear to be very significant, the programs being able to handle a large variety of glasses. The numerical methods used for Flair are being investigated, including matrix inversion with a Hilbert matrix. No program was found that can invert a 6 x 6 Hilbert matrix with better than two place accuracy.

AD-623 463 Div. 25/4 ,8/6
CFSTI Prices: HC $4.00 MF $0.75
MARTIN CO ORLANDO FLA
EXCITATION AND DETECTION TECHNIQUES FOR MILLIMETER WAVE TRANSITIONS.
Final rept. for 1 Jul 62-1 Jul 65,
by J. J. Gallagher, R. G. Strauch, and R. E. Cupp. 1 Jul 65, 107p. Rept. no. OR-6653 Contract DA36 039sc90753 Proj. 1P6 22001A056

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-617 397.

Descriptors: (*Molecular beams, Millimeter waves), (*Millimeter waves, Molecular beams), Excitation, Detection, Demodulation, Electron bombardment, Resonance, Interferometers, Electron transitions, Hydrogen compounds, Sulfides, Frequency, Standards, Phase-locked systems, Atomic clocks

The purpose of this contract is to investigate the excitation and detection techniques for molecular millimeter wave transitions which can be used to develop a frequency standard operating in the region of 200 to 300 Gc. The part of the project concerned with the excitation of molecular transitions is a study of the means of providing a highly stable exciting signal with sufficient power to induce transitions, and an investigation of the resonant structure techniques for exciting the beam. The second part, the study of detection techniques, covers methods of detecting molecular transitions with provision for using the detected signal for frequency control. (Author)

AD-623 520 Div. 25/4 ,14/7 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
THREE-LAYER REFLECTION-REDUCING COATINGS FOR OPTICAL ELEMENTS,
by L. B. Lockhart. 29 May 46, 26p. Rept. no. NRL-2849

Unclassified report

Previously announced 12 Feb 57 as PB-120 770, LC mi $2.70, ph $4.80. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Optical coatings, Reflection), (*Reflection, Reduction), (*Glass, Optical coatings), Films, Refractive index, Effectiveness, Wear resistance, Surfaces

An investigation was made of three-layered reflectionreducing films similar in principle to those recently developed in Germany. Very effective coatings have been produced by use of materials of the type developed by the American Optical Company. The maximum expected reduction in reflection has not been obtained, however, because none of the available materials has a high enough refractive index. The difficulty involved in the preparation of the coatings probably makes them undesirable for general use but they may be suitable for special uses where the greatest possible reduction in reflection is required. For the latter cases, it might be desirable to produce these coatings through use of an evaporation process similar to that now used to produce magnesium fluoride coatings or through a vapordeposition process similar to the German one, since materials of higher index are available through these techniques and three-layered coatings of lower reflection are thus possible. The three-layered reflection-reducing coatings produced through the use of the American Optical Company type solutions are sufficiently durable to withstand normal usage but they are not as resistant to abrasion as the best grade of evaporated magnesium fluoride coatings. (Author)

AD-623 521 Div. 25/4 ,14/7 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
APPROXIMATE THEORY OF LOW REFLECTING FILMS,
by E. O. Hulburt. 18 Nov 44, 26p. Rept. no. NRL-2403

Unclassified report

Previously announced 26 Jul 46 as PB-23 641, LC mi $0.50 ph $2.00. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Optical coatings, Reflection), (*Reflection, Reduction), (*Glass, Optical coatings), Numerical analysis, Refractive index, Thickness, Design, Films

For the purpose of facilitating the design of low reflecting transparent films on glass, the optical theory is outlined and the theoretical formulas are worked out to a second degree of approximation. Theoretical curves of the reflection are calculated for several cases of one and two films on glass for various thicknesses and refractive indices of the films and of the glass. (Author)

AD-623 522 Div. 25/4 ,14/7 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
REFLECTION-REDUCING COATINGS FOR GLASS AND TRANSPARENT PLASTIC SURFACES.
Rept. no. 2,
by Peter King. 27 Feb 43, 26p. Rept. no. NRL-2008

Unclassified report

Previously released 29 May 47 as PB-66 136, LC mi $1.00, ph $1.00. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Optical coatings, Reflection), (*Reflection, Reduction), (*Glass, Optical coatings), (*Plastics, Optical coatings), Films, Silicates, Solvents, Colloids, Feasibility studies

The results obtained in these experiments show that it is possible to coat either glass or plastic in one operation with a reflection reducing film which is at least semipermanent. The film will not be damaged by washing provided a sponge is used with soap and water but no abrasive. The resistance of the films to salt spray and artificial weathering is such that further tests, particularly service tests, should be made.

AD-623 523 Div. 25/4 ,14/7 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
REFLECTION-REDUCING COATINGS FOR OPTICAL SURFACES.
Rept. for Oct 43-Mar 44,
by Peter King, and L. Lockhart. 30 Mar 44, 29p. Rept. no. NRL-2257

Unclassified report

Previously announced 5 Nov 47 as PB-78 595, LC mi $1.00, ph $2.00. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Optical coatings, Reflection), (*Reflection, Reduction), (*Glass, Optical coatings), Films, Preparation, Esters, Silicon compounds, Silanes, Chlorine compounds, Surfaces

A study of a two-coat reflection-reducing film was made, particularly as regards the method of formation of these films and their properties. The preferred method of application was found to be the addition of portions of Solution no. 157c to glass disks while rotating at 4750 RPM followed by the application of Solution no. 50a (containing 5% butanol) at 2300-2500 RPM with a 15-minute baking at 100-105C after each addition of solution. The

films so formed were uniform, clear and hard and very efficient in reducing reflection. A typical disk of 1.525 index glass coated with this system gave a reflection of 0.14% per surface of incident light of 5500 A wave length. The use of various silicon esters for the formation of single-coat films was studied and found to give, at best, films capable of reducing reflection of light from glass of 1.52 index to about 50% of its original value. The films prepared from methyl and ethyl silicates were hard, clear, water-repellent, and were the most effective esters in reducing reflection. Investigation of the use of various silicon compounds (Dow-Corning fluids 400 and 1300, dimethyl silicon dichloride and ethyl silicon trichloride) showed dimethyl silicon dichloride to be the only one capable of giving good nonwetting surfaces without harming the reflection-reducing properties of the films. (Author)

AD-623 524 Div. 25/4 ,14/7 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
SURVEY OF TWO-COAT REFLECTION-REDUCING FILMS,
by L. B. Lockhart,Jr.. 15 Jan 45, 38p. Rept. no. NRL-2440

Unclassified report

Previously announced 23 Oct 47 as PB-78 594, LC mi $1.00, ph $3.00. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Optical coatings, Reflection), (*Reflection, Reduction), (*Glass, Optical coatings), Reviews, Surfaces, Films, Effectiveness, Thickness, Refractive index

A comprehensive study (theoretical and experimental) of two-coat reflection reducing films was made with particular emphasis on the effects of variations of the thicknesses and of the refractive indices of the films on the reflection reducing efficiencies of the coatings. The experimental results were compared with theoretical values calculated through the use of equations developed by Dr. B. Salzberg, relating to the reflection of electromagnetic waves from coated surfaces. Several combinations of films were found to give spectral reflection curves having reflection minima below 0.2% per surface and overall reflections approximately the same as that of the type recommended previously. At this time, no particular advantage would be gained by changing to any of these other combinations of films. No significant increase in effectiveness of these films is possible until a film having an index of refraction appreciably lower than 1.47 is adapted for use with a higher index film. (Author)

AD-623 624 Div. 25/4 ,25/6
LINCOLN LAB MASS INST OF TECH LEXINGTON
PBS DIODE LASER,
by J. F. Butler, and A. R. Calawa. 1 Jun 65, 2p.

Unclassified report

Pub. in Journal of the Electrochemical Society v112 n10 p1056-7 Oct 1965 (Copies not available to DDC or Clearinghouse customers). Prepared for presentation at San Francisco Meeting, 9-13 May 65.

Descriptors: (*Lasers, Diodes (Semiconductor)), (*Lead compounds, Sulfides), (*Diodes (Semiconductor), Lasers), Cryogenics, Intensity, Infrared radiation

The article presents infrared emission, CW spectra and multimode emission data at 4.2K for the PbS diode laser.

AD-623 634 Div. 25/4
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
INTRODUCTION TO THE THEORY OF ELECTRON OPTICS,
by Johannes Picht. Nov 65, 25p. Rept. no. T-1808-65
Contract DA44 009AMC930T Proj. DA1P014 501A31B
TT , 65-64499

Unclassified report

Trans. of mono. Einfuhrung in die Theorie der Elektronenoptik, (2d), Leipzig, 1957 p14-7, 137-50.

Descriptors: (*Electron optics, Theory), East Germany, Differential equations, Transformations (Mathematics), Electron beams, Trajectories, Electric fields, Electrons

AD-623 115 **See Fld. 20/3**

AD-623 125 **See Fld. 20/3**

AD-623 204 **See Fld. 17/2**

AD-623 260 **See Fld. 17/2**

AD-623 262 **See Fld. 11/2**

AD-623 328 **See Fld. 17/7**

AD-623 351 **See Fld. 20/14**

AD-623 397 **See Fld. 20/12**

AD-623 406 **See Fld. 4/2**

AD-623 415 **See Fld. 7/4**

AD-623 478 **See Fld. 4/2**

AD-623 482 **See Fld. 4/2**

AD-623 511 **See Fld. 20/2**

AD-623 513 **See Fld. 4/2**

AD-623 612 **See Fld. 20/12**

20/8. PARTICLE PHYSICS

AD-623 169 Div. 25/7 ,20/3
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH GEO-ASTRO PHYSICS LAB
ELECTRON RETARDING POTENTIAL STUDIES OF PHOTOIONIZATION,
by P. H. Doolittle, and R. I. Schoen. Sep 65, 26p. Rept. no. D1-82-0463

Unclassified report

Prepared for presentation at the American Society for Testing Materials meeting on Mass Spectroscopy and Allied Topics, St. Louis, Mo., 16-21 May 65. Also available from the authors.

Descriptors: (*Ionization potentials, Electrons), (*Photoelectric effect, Ionization), Atomic energy levels, Electron transitions, Probability, Ions, Argon, Hydrogen, Nitrogen compounds, Oxides

The use of the electron retarding potential technique in studies of ionization thresholds and relative transition probabilities to various electronic and vibrational states of ions is discussed. The gases argon, nitric oxide and hydrogen are used to illustrate the technique. The assignment of one electronic state in NO (+) is shown to be questionable and the role that autoionization may play in vibrational excitation is exhibited. (Author)

AD-623 193 Div. 25/7
CFSTI Prices: HC $1.00 MF $0.50
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF PHYSICS
QUANTITATIVE HIGH TEMPERATURE INFRARED SPECTROSCOPY.
Final scientific rept.,
by U. P. Oppenheim. 30 Apr 65, 4p. Contract AF EOAR63 111
AFOSR , 65-1490

Unclassified report

Descriptors: (*Infrared spectroscopy, High temperature research), (*Water vapor, Emissivity), (*Emissivity, Water vapor), Band spectrum, Israel

Spectral emissivity studies were made of the three water vapor bands at 1.9, 2.7 and 6.3-microns. Atmospheric interference was successfully eliminated by building a hermetically sealed optical system, from which absorbing gases could be eliminated. Spectral studies with a resolution of 0.5/cm were carried out for H2O vapor at 1200K in the 1.9 and 2.7-microns bands. By the use of spectral band models the band parameters and the integrated intensity of these two bands were determined at 1200K. The method of 'curves of growth' was also applied to atmospheric absorption by CO, N2O and H2O at room temperature. Total emissivity calculations were made on H2O at 1200K, based on the contributions of spectral band emissivities in the 1.9, 2.7 and 6.3-microns regions. The integrated intensity of the 6.3-microns band was established by measuring the intensity of a single rotational line in this band. (Author)

AD-623 246 Div. 20/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ULTRASONIC ATTENUATION STUDIES OF IRRADIATED MATERIALS: ANNOTATED BIBLIOGRAPHY.
AID Work assignment no. 43, task 25.
24 Apr 64, 11p. Rept. no. AID-U-64-28
TT , 65-64457

Unclassified report

Based on Soviet open literature available at the Aerospace Information Div., Library of Congress.

Descriptors: (*Bibliographies, Ultrasonic radiation), (*Ultrasonic radiation, Attenuation), Abstracting, USSR, Absorption, Gases, Crystals, Paramagnetic materials, Magnetic resonance, Metals, Electrolytes, Semiconductors, Magnetic properties

AD-623 249 Div. 20/2 ,22/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
NUCLEAR WEAPONS EFFECTS: COMPILATION OF ABSTRACTS.
Rept. no. 1 on AID Work assignment no. 66.
15 May 64, 22p. Rept. no. AID-U-64-38
TT , 65-64460

Unclassified report

Preliminary rept. of Soviet open sources for the period Jan 56-Mar 64. Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Nuclear weapons, Explosion effects), (*Explosion effects, Reviews), USSR, Shock waves, Radiation damage, Thermal radiation, Heat transfer, Plasma medium, Bibliographies

Contents: Structure and parameters of strong shock waves in gases; Parameters of strong shock waves in solids; Propagation of strong shock waves; Interaction of strong shock waves with materials; Nuclear explosion effects; The meteorite analogy; Radiative heat transfer.

AD-623 254 Div. 25/7 ,4/4 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
ROYAL HOLLOWAY COLL UNIV OF LONDON (ENGLAND)
VERY LOW-FREQUENCY INFRA-RED SPECTROSCOPY.
Final technical rept. for 1 Oct 61-30 Sep 65,
by Arthur Finch, and P. N. Gates. 30 Sep 65, 5p.
Contract N62558 3030 Proj. NR051 434 Task 051 434

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-608 145.

Descriptors: (*Infrared spectroscopy, Very low frequency), (*Infrared spectrophotometers, Design), (*Spectra (Infrared), Chemical compounds), Inorganic compounds, Performance (Engineering), Great Britain

The project had two main objectives: (a) the design and construction of an infrared spectrometer which would operate below the region accessible to commercial instruments (i.e. below ca. 380/cm.) and (b) the application of the spectrometer to various problems of interest, and especially to inorganic molecules. Objective (a) was essentially completed by December, 1962, although considerable modifications were effected during the subsequent six months. Since that time continuous use of the instrument has been made.

AD-623 286 Div. 25/7
CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT VALCARTIER (QUEBEC)
CALCULATION OF COMBINED DOPPLER AND COLLISION BROADENING,
by W. J. Surtees. 18 Jan 65, 1p.

Unclassified report

Pub. in Journal of the Optical Society of America v55 n7 p893-4 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Line spectrum, Doppler effect), Integrals, Complex variables

It is pointed out that tables of the complex Fresnel integral may be useful in studies of combined Doppler and collision broadened line profiles.

AD-623 287 Div. 20/2 ,25/5
DEFENSE RESEARCH CORP SANTA BARBARA CALIF
SOLUTION OF THE KLEIN-GORDON AND DIRAC EQUATIONS FOR A PARTICLE WITH A PLANE ELECTROMAGNETIC WAVE AND A PARALLEL MAGNETIC FIELD,
by Peter J. Redmond. 24 Dec 64, 8p.
AROD , 4157:3

Unclassified report

Pub. in Journal of Mathematical Physics v6 n7 p1163-9 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Particle trajectories, Partial differential equations), (*Field theory, Quantum mechanics), Electromagnetic waves, Magnetic fields, Charged particles, Relativity theory, Vacuum

Solutions of the Klein-Gordon and Dirac equations are obtained for a particle moving in an arbitrary plane electromagnetic wave in vacuo plus a uniform static magnetic field parallel to the direction of propagation of the electromagnetic wave. (Author)

AD-623 339 Div. 20/2 ,25/2
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
INELASTIC SCATTERING OF NEUTRONS BY ANHARMONIC CRYSTALS.
Technical rept.,
by Vinay Ambegaokar, John M. Conway, and Gordon Baym. 1964, 13p. Rept. no. TR-8
Contract Nonr40138

Unclassified report

Pub. in Lattice Dynamics, Proceedings of the International Conference held at Copenhagen (Denmark) 5-9 Aug 1963 p26/-70 (Copies available only to DDC users).

Descriptors: (*Neutron scattering, Crystal lattices), (*Inelastic scattering, Neutron scattering), Phonons, Excitation, Resonance, Neutron diffraction analysis, Perturbation theory

A theoretical framework is provided within which to determine the phonon frequencies and lifetimes from inelastic scattering of neutrons by crystals. When a crystal has anharmonicities interference effects can occur between in which the neutron creates only one phonon and processes in which it creates several phonons; these coherences are due to the fact that when a phonon can decay into several phonons, the final state in which the neutron has created one phonon is not orthogonal to final states in which the neutron has created several phonons. The one-phonon cross-section has a resonance at the phonon frequency, with a width proportional to the inverse of the phonon lifetime. The interference terms have the effect of shifting the center of this resonance, as observed, from the one-phonon frequency, and also changing the shape from an expected Lorentzian form. A very crude estimate of the effect is made which indicates that under favorable conditions in lead interference effects may lead to an asymmetry in the line shape of the order of a few per cent. It would appear that the anharmonicities in a crystal place an upper limit on the accuracy with which one can directly determine the phonon frequencies and lifetimes from the one-phonon resonances in neutron scattering data. (Author)

AD-623 353 Div. 20/2
NEVIS LABS COLUMBIA UNIV IRVINGTON-ON-HUDSON N Y
MUON CAPTURE BY DEUTERONS,
by I-T Wang. Sep 65, 8p. Rept. no. R-493
Contract Nonr26672

Unclassified report

Pub. in Physical Review v139 n6B pB1539-44 Sep 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson capture, Deuteron reactions), Muons, Neutron spectrum, Neutron scattering, Nuclear spins

Rates of muon capture from the separate muond hyperfine states are computed. The dependence of the measurement of effective coupling constants on the neutron enery is explicitly demonstrated. The calculation of the neutron energy spectra includes mainly the following refinements: (1) use of two-nucleon wave functions with hard core, (2) corrections for the targetproton momentum, and (3) inclusion of certain induced pseudoscalar terms. The capture rates obtained are 334 and 15/ sec for the muon-d doublet and quartet states, respectively. (Author)

AD-623 354 Div. 20/2
NEVIS LABS COLUMBIA UNIV IRVINGTON-ON-HUDSON N Y
MUON CAPTURE IN (P-MUON-D) + MOLECULES,
by I-T Wang, E. W. Anderson, E. J. Bleser, L. M.Lederman, and S. L. Meyer. Sep 65, 13p.
Rept. no. R-492
Contract Nonr26672

Unclassified report

Pub. in Physical Review v139 n6B pB1528-38 Sep 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson capture, Deuteron reactions), (*Muons, Meson capture), Protons, Deuterons, Ions, Molecules, Neutrinos, Neutron scattering, Hyperfine structure

The (p-muon-d)+ molecules and muon-He3 atoms formed in liquid hydrogen were used to detect neutrons from muon capture by deuterons and from muon capture by He3. In the experiment, a purified muon beam was stopped in a target containing ultra-pure liquid hydrogen with 0.32% deuterium added. Neutron-gamma-ray discriminating detectors and oscilloscope photography enabled us to measure the time distribution of neutrons from the following rare muon-capture processes: muon (-) +d to neutrino +2n, muon (-)+ He3 to neutrino + n + d to neutrino + 2n + p. Knowledge of the time distributions of the various (p-muon-d)+ hyperfine states and of the muon-He3 atoms was used to unravel the various muon-capture rates of interest. Converted to the muon-d atom case, the measured rate gives 365=96/sec for muon capture from the doublet state of muon-d. This is to be compared with the theoretical rate of 334/sec predicted by the current phenomenological muon-capture theory; and it provides the simplest verification of the Pauli exclusion-principle effect in muon capture. The neutron rate from muon capture by He3 was determined to be 1,200=170/sec. (Author)

AD-623 355 Div. 20/2
NEVIS LABS COLUMBIA UNIV IRVINGTON-ON-HUDSON N Y
STUDY OF THE 'BREAKUP' CHANNELS OF MUON CAPTURE BY HE3,
by I-T Wang. Sep 65, 6p. Rept. no. R-494
Contract Nonr26672

Unclassified report

Pub. in Physical Review v139 n6B pB1544-7 Sep 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson capture, Helium), (*Muons, Meson capture), Neutron spectrum, Neutrinos, Neuton scattering, Proton scattering, Nuclear spins, Fermions, Hydrogen

Neutron energy spectra are obtained for the processes of muon capture by He3 into the 'breakup' channels: muon+He3 to neutrino +n+d and muon+ He3 to neutrino+2n+p. The chief approximations are the use of plane waves for the relative motions between the final nuclear particles and a Gaussian-type wave function for the He3 nucleus. The rates obtained for the two 'breakup' channels are, respectively 988 and 272/sec. (Author)

AD-623 356 Div. 20/2
NEVIS LABS COLUMBIA UNIV IRVINGTON-ON-HUDSON N Y
SEARCH FOR THE TETRANEUTRON VIA THE REACTION PION (-)+ 7LI TO 4N+3HE,
by R. C. Cohen, A. D. Kanaris, S. Margulies, and J. L. Rosen. Jun 65, 5p. Rept. no. R-495
Contract Nonr26672

Unclassified report

Pub. in Physics Letters v16 n3 p292-3 Jun 1 1965 (Copies available only to DDC users).

Descriptors: (*Meson capture, Lithium), Pions, Helium, Neutron scattering, Neutrons

Continuing investigations of two-body breakups following pion (-) absorption at rest in lithium led to a search for tetraneutrons produced in the reaction pion (-)+ 7Li to 4n+3He.

AD-623 386 Div. 20/1
CFSTI Prices: HC $3.00 MF $0.75
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
CHARGE EXCHANGE BETWEEN GASEOUS IONS AND ATOMS.
Technical rept.,
by Donald Rapp, and William E. Francis. Mar 62, 67p. Rept. no. LMSC-6-90-62-66
Unclassified report

Descriptors: (*Gas ionization, Probability), (*Atomic charge, Exchange reactions), Ion exchange, Ionization potentials, Gases, Atoms, Ions, Electron transitions

A calculation of symmetric resonant charge exchange cross-sections was made for a selection of atoms in the velocity range where the impact parameter method is applicable. Cross-sections for other atoms can be estimated by interpolating in terms of their ionization potentials. The results are in fair agreement with experiment. A similar calculation has been attempted for asymmetric nonresonant charge exchange processes. The approximations used are more restrictive in this calculation, the calculations being only semi-quantitative in nature. The cross-section of an asymmetric charge exchange process is determined in terms of the difference in ionization potentials of the reaction and the 'average' ionization potential of the two atoms. The results are qualitatively in agreement with experiment. A very brief discussion is given of approaches for extrapolating data to lower velocities, where the rectilinear orbit impact parameter method is not applicable. (Author)

AD-623 416 Div. 25/7
CFSTI Prices: HC $1.00 MF $0.50
CHICAGO UNIV ILL LABORATORY OF MOLECULAR STRUCTURE AND SPECTRA
MOLECULAR STRUCTURE AND SPECTRA.
Quarterly status rept. no. 35, 1 Jul-30 Sep 65,
by Robert S. Mulliken. 30 Sep 65, 10p. Contract Nonr212101 Proj. 014 101
Unclassified report

Descriptors: (*Molecular structure, Molecular spectroscopy), (*Molecular spectroscopy, Molecular structure), Helium, Chemical bonds, Diatomic molecules, Bromine

Work is summarized on molecular structure and spectra. Emission spectra of He2 and Bromine are discussed. Work on Rydberg-Klein-Rees potential energy curves, chemical bonding in diatomic molecules, and Rydberg states of diatomic molecules in summarized.

AD-623 480 Div. 25/7 ,25/3 ,2/1
CFSTI Prices: HC $4.00 MF $1.00
JOINT INST FOR LABORATORY ASTROPHYSICS BOULDER COLO
ELECTRON IMPACT IONIZATION CROSS-SECTION DATA FOR ATOMS, ATOMIC IONS AND DIATOMIC MOLECULES. I. EXPERIMENTAL DATA,
by L. J. Kieffer, and Gordon H. Dunn. 11 Oct 65, 139p. Rept. no. JILA-51
Unclassified report

Descriptors: (*Ionization, Diatomic molecules), (*Electron bombardment, Atoms), Electrons, Ions, Plasma physics, Probability, Astrophysics, Mass spectroscopy, Helium group gases, Hydrogen, Nitrogen, Oxygen, Alkali metals

A compilation and a critical evaluation are given of absolute cross sections for ionization of atoms and diatomic molecules by electron impact. Experimental techniques used for ionization are surveyed. Selected relative cross sections for production of multiply charged ions and a brief discussion of relative cross section data near threshold are presented. Absolute limits are not set on the size of probable systematic errors in the various experiments. (Author)

AD-623 485 Div. 20/2 ,20/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
PHYSICAL AND RADIOCHEMICAL PROPERTIES OF FALLOUT PARTICLES,
by Glenn R. Crocker, Joseph D. O'Connor, and Edward C. Freiling. 15 Jun 65, 24p. Rept. no. USNRDL-TR-899
Contract AT49 2505 4
Unclassified report

Descriptors: (*Radioactive fallout, Experimental data), Particles, Particle size, Radioactivity, Air burst, Surface burst, Fission products, Physical properties

A survey has been made of the very large body of literature now existing on the characteristics of fallout particles. An attempt is made to summarize in concise form the ranges of physical and radio-chemical properties of particles of the debris produced by devices detonated under various conditions. The results of studies of the leaching action of various solvents on fallout particles are also summarized. (Author)

AD-623 498 Div. 20/2
FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)
NUCLEAR INTERACTIONS OF THE SECONDARY PARTICLES OF HIGH-ENERGY COSMIC-RAY 'JETS',
by E. Farrow, C. F. Gauld, C. B. A. McCusker, J. Malos, and K. Nishikawa. 29 Oct 62, 9p. Contract AF AFOSR61 92 ,AF AFOSR62 410
AFOSR , 4790
Unclassified report

Pub. in Il Nuovo Cimento (Italy) v28 (S10) p1238-45 16 Jun 63 (Copies available only to DDC users).

Descriptors: (*Nuclear reactions, Cosmic rays), (*Cosmic rays, Nuclear reactions), Pions, Meson reactions, Proton reactions, Protons, Alpha particle reactions

Fifty-five interactions in the energy range 1 to 100 GeV of secondary particles of cosmic-ray jets have been examined. The energy was determined by finding the angle between the secondary and primary direction and assuming a transverse momentum of 0.4 GeV/c. The interaction mean free path was 41.7 cm, the average number of shower particles varied from 1.3 to 6.4 and the average number of black prongs from 5.8 to 8.3 as the energy went from 2.8 to 34.6 GeV. The agreement with machine work is good, in contrast to previous experiments where the Castagnoli method of energy estimation and/or area scanning was used. The application of the method to energies around 1000 GeV is discussed. (Author)

AD-623 564 Div. 20/2
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SCATTERING OF LIGHT BY PROTONS.
Revised ed.,
by W. J. Karzas, W. K. R. Watson, and F. Zachariasen. 11 Nov 57, 33p. Rept. no. P-1126
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Photons, Scattering), (*Proton scattering, Photons), Photonuclear reactions, Meson scattering, Light, Nuclear magnetic moments, Phase shift, Perturbation theory, Compton scattering

Within the framework of the Chew-Low-Wick development an analysis of the scattering of photons from a nucleon is carried out. It is shown that an exact relationship exists between the Compton Effect amplitude and the experimental meson-nucleon scattering phase shifts for all multipoles except magnetic dipole and electric quadrupole provided that effects arising from currents inside the nucleon source are slowly varying functions of photon energy. That part of the magnetic dipole scattering which can be described in terms of the isotopic vector part of the anomalous magnetic moments of the nucleon is also treated exactly. The cross section for the Compton process is evaluated on the basis of the electric and magnetic dipole contributions only, since a non-recoil theory is clearly expected to be poor for photon energies greater than 300 Mev. Fairly good agreement with experiment is achieved. (Author)

AD-623 632 Div. 20/2 ,2/6
CFSTI Prices: HC $7.00 MF $1.75
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB
A STUDY OF VERTICALLY INCIDENT COSMIC-RAY TRAJECTORIES USING SIXTH-DEGREE SIMULATIONS OF THE GEOMAGNETIC FIELD.
Environemtnal research papers,
by M. A. Shea, D. F. Smart, and K. G. McCracken. Sep 65, 389p. Rept. no. AFCRL-65-705, ERP-141
Proj. AF8600 Task 860001
Unclassified report

Descriptors: (*Cosmic rays, Particle trajectories), (*Nuclear physics, Cosmic rays), Angle of arrival, Radiation measurement systems, Terrestrial magnetism, Simulation, Experimental data, Tables, Geophysics, Astrophysics

A study has been made of vertically incident cosmic-ray trajectories at more than 400 positions on the earth's surface using sixth-degree simulations of the quiescent geomagnetic field. Twenty-six of these positions are near the South African magnetic anomaly, and six other points are in a region of the North Atlantic where Pomerantz and Agarwal have reported anomalous results. The trajectories have been calculated for rigidities separated by intervals as small as 0.01 bv to allow for the effects of the penumbra. When these trajectories are used to determine cosmic-ray cutoff rigidities, differences greater than 15 percent from the Quenby and Wenk threshold values are found in the vicinity of South Africa, the South Atlantic, and the Canary Islands. Various latitude surveys are shown to exhibit consistency when plotted against the cutoff rigidities determined by this computational method. It is concluded that although currently available simulations of the geomagnetic field are not completely adequate over some portions of the earth to describe the cosmic-ray effects in their entirety, there is essentially no difference in the cutoff rigidities determined using two currently accepted field models, even though different penumbral structures are obtained. Asymptotic directions of approach and cutoff rigidities for a number of locations are listed. (Author)

AD-623 658 Div. 20/1 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
WIDE ANGLE ELECTRON-ELECTRON SCATTERING ON THE PRINCETON-STANFORD STORAGE RINGS,
by W. C. Barber, B. Gittelman, G. K. O'Neill, and B. Richter. Sep 65, 20p. Rept. no. HEPL-405
Contract Nonr22567 ,Nonr185839
Unclassified report

Prepared in cooperation with Palmer Physical Lab., Princeton Univ., N. J., and Stanford Linear Accelerator Center, Stanford Univ., Calif. Prepared for presentation at the International Conference on High Energy Accelerators (5th), at Frascati (Italy), 9-16 Sep 65.

Descriptors: (*Elastic scattering, Electrons), (*Electron accelerators, Elastic scattering), Electron beams, Differential cross section, Cosmic rays, Background

The angular distribution of 416 electron-electron scattering events occurring when beams of 300 MeV electrons collide has been measured. The experimental angular distribution was compared with that predicted by the Moller formula with a cut-off on the photon propagator. The best fit occurs for 1/K = about 0.18 Fermi. The value 1/K = O (no breakdown of quantum electrodynamics) is only one standard deviation from the best fit.

AD-623 115 See Fld. 20/3

AD-623 189 See Fld. 20/10

AD-623 340 See Fld. 20/12

AD-623 541 See Fld. 7/4

AD-623 668 See Fld. 20/12

20/10. QUANTUM THEORY

AD-623 189 Div. 25/5 ,20/2
CFSTI Prices: HC $2.00 MF $0.50
ARGONNE NATIONAL LAB ILL
INSIDE QUANTUM FIELD THEORY AND LECTURES ON NEUTRINO INTERACTIONS,
by Frank Chilton. Dec 64, 35p. Rept. no. ANL-6989
Contract W31 109eng38
Unclassified report

Prepared in cooperation with Stanford Univ., Calif., Dept. of Physics. Grant AF AFOSR62 452.

Descriptors: (*Field theory, Quantum mechanics), (*Neutrinos, Field theory), Hyperons, Nuclear reactions, Nuclear models, Bosons, Fermions

A review and summary is provided of the fundamental ideas of quantum field theory, including interacting and noninteracting fields, neutrino interactions, and hyperon production in an SU3 model.

AD-623 546 Div. 25/5 ,8/2
CFSTI Prices: HC $4.00 MF $1.00
DAVID TAYLOR MODEL BASIN WASHINGTON D C
INTRODUCTION TO NON-LINEAR MECHANICS. PART III: NON-LINEAR RESONANCE,
by N. Minorsky. May 46, 137p. Rept. no. 558
Unclassified report

See also PB-23 639, AD-609 701.

Descriptors: (*Mechanics, Nonlinear systems), (*Resonance, Nonlinear systems), Theory, Excitation, Frequency, Harmonic analysis, Parametric amplifiers

The report deals with the complicated phenomena of non-linear resonance with its numerous ramifications such as internal and external subharmonic resonance, entrainment of frequency, parametric excitation, and the like.

AD-623 276 See Fld. 3/1

AD-623 287 See Fld. 20/8

AD-623 398 See Fld. 20/13

AD-623 648 See Fld. 20/14

20/12. SOLID STATE PHYSICS

AD-623 144 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS
HIGH PRESSURE RESEARCH AND SEMICONDUCTOR PHYSICS.
Progress rept.
May 65, 18p. Rept. no. PR-35
Contract Nonr186610
Unclassified report

Descriptors: (*High-pressure research, Reviews), (*Semiconductors, Physical properties), Lead compounds, Salts, Optical properties, Electrical properties, Tin, Spectroscopy, Nuclear magnetic resonance, Transition elements, Oxides, Spectrophotomers, Magnetooptic effect, Semiconducting films, Gallium alloys, Antimony alloys, Band spectrum, Diodes (Semiconductor), Lasers

Progress in the following areas is summarized: Optical and electrical properties of lead salts under pressure; electrical properties of grey tin as a function of pressure; effect of pressure on reflectivity spectra; spin resonance measurements on semiconductors; properties of the transition metal oxides; new ratio type spectrometer for the measurement of small increments in absorption coefficients; semiconducting properties of fosterite; Faraday rotation in semiconductors; optical properties of semiconductor thin films; band structure of gallium antimonide; infrared shift of the emission of lead salt diodes with pressure.

AD-623 159 Div. 25/6 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF
DISLOCATION SLIP PLANES AND SHEAR CRACKS IN ORTHOTROPIC MEDIA,
by Nazeer Ahmed. May 65, 19p. Rept. no. WR-65-11
Unclassified report

Descriptors: (*Shear stresses, Deformation), (*Fracture (Mechanics), Shear stresses), Elasticity, Strain (Mechanics), Fourier analysis, Integral equations, Boundary value problems, Crystal lattice defects

The elastic stress field in the vicinity of a dislocation slip plane in an infinite orthotropic medium subjected to uniform shear at infinity is determined using a formulation in integral equations. It is assumed that a slip plane is different from a traction free surface crack in that it has uniform shear on its surface and remains closed under the applied stress field. However, the use of these mixed boundary conditions under the restrictions of plane stress in linear elasticity is found to give the same stress distribution as that for a shear crack. Although a shear crack under an applied uniform shear opens up into an ellipse, the opening per unit length is shown to be so small that for most engineering applications it can be considered closed and the equivalence of a shear crack and a slip plane is established. It is pointed out that this correspondence is not valid between a shear crack in a thick elastic plate and a slip plane in an infinite elastic medium. Results for an isotropic body are given as a limiting case of an orthotropic body. (Author)

AD-623 164 Div. 25/6 ,25/3
CFSTI Prices: HC $6.00 MF $1.25
CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
SPIN WAVE INSTABILITIES AND RELAXATIONS IN FERROMAGNETIC METALS.
Scientific rept.,
by James B. Comly. Aug 65, 224p. Rept. no. SR-5 (Series 3) ,TR-485
Contract AF19 628 3874 ,Nonr186616 Proj. 5635 ,NR372 012 Task 563503
AFCRL , 65-613
Unclassified report

Descriptors: (*Ferromagnetic materials, Magnetic properties), (*Pumping (Electronics), Ferromagnetic materials), Relaxation time, Stability, Metals, Magnetic resonance, Microwave frequency, Oscillations, Paramagnetic resonance, Excitation, Metal films

The first useful measurements of parallel-pumped instability (PPI) thresholds in metals were made on vacuum-deposited films and rolled foils of the nickel: iron alloy, permalloy, using a pulse-power modulation of the usual electron paramagnetic resonance field modulation signal recovery technique. It is shown that PPI signals can be observed in films thinner than microwave skin depth, and in polycrystalline foils many skin depths thick. Relaxation rates of spin waves are determined.

AD-623 174 Div. 25/6 ,25/2
CFSTI Prices: HC $2.00 MF $0.50
BROWN UNIV PROVIDENCE R I
STUDY OF SURFACE PROPERTIES OF ATOMICALLYCLEAN METALS AND SEMICONDUCTORS. PART 1. STUDY OF CDS SURFACES BY LEED. PART 2. COMBINED LEED AND MASS SPECTROMETER MEASUREMENTS FOR ADSORPTION AND CATALYSIS.
Progress rept. no. 7, 1 Jan-30 Jun 65,
by H. E. Farnsworth, B. D. Cambell, and M. Onchi. Jul 65, 29p. Contract DA28 043AMC00299E Proj. DA 1A0 10501B010
Unclassified report

See also AD-623 174.

Descriptors: (*Semiconductors, Surface properties), (*Cadmium compounds, Sulfides), (*Nickel, Surface properties), Crystal growth, Purification, Ion bombardment, Heat treatment, Oxygen, Adsorption, Photoelectric effect, X-ray diffraction analysis, Catalysis, Carbon compounds, Monoxides, Mass spectroscopy

The (000/1) MATTE natural growth surface of a vapor grown CdS crystal which had not been polished or etched was studied. It was not possible to obtain a clean surface by heating alone because of contamination from the bulk. Ion bombardment and annealing produced (10/1/4) planes as was found on previously studied crystals. Oxygen adsorption studies of the (000/1) MATTE surface, after using Ga-In eutectic to make contact to the crystal mount, were made. However, the magnitude of these changes was not reproducible. Oxygen adsorption studies of the (0001) SPECULAR surface with no Ga-In contact revealed that photoassisted adsorption occurred. The change in surface potential was approximately directly proportional to the change in oxygen coverage as estimated from decreases in diffraction pattern intensities. This indicates that the oxygen forms negative surface states. The system involving a combination of LEED and quadrupole mass spectrometer was assembled and tested with self oxidation of CO on a (100) nickel crystal surface. (The diagonal mark (/) is here used to indicate the rotation-inversion axis).

AD-623 322 Div. 25/6
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
DYNAMIC RESPONSE OF TWO-LAYERED CYLINDRICAL SHELLS TO TIME-DEPENDENT LOADS.
Revised ed.,
by David Bushnell. 17 May 65, 6p. Contract NOw63 0050C
Unclassified report

Pub. in AIAA Journal v3 n9 p1698-1703 Sep 65
(Copies not available to DDC or Clearinghouse

customers). Revision of manuscript submitted 4 Jan 65.

Descriptors: (*Structural shells, Loading (Mechanics)), (*Cylindrical bodies, Loading (Mechanics)), Elastic shells, Vibration, Distribution, Mathematical analysis, Dynamics, Stresses, Series

A modal analysis is used to predict the response to time-dependent loads of a finite-length, simply supported elastic circular cylindrical shell composed of two bonded isotropic layers. A shell of infinite length subjected to an external load with no axial component is also analyzed. Calculations were made for the specific case of a twolayered cylindrical shell loaded impulsively by a lateral blast distributed sinusoidally around half of the circumference. It is found that, for the particular loading treated, the axial stress in the finite-length shell has a larger amplitude than the circumferential stress, even though the load has no axial component and even though the shell is not axially constrained in any way at the edges. A dynamic edge effect is seen to propagate into the shell. Use of a 'ring' model of an infinite-length shell subjected to an axially uniform pressure pulse leads to an accurate prediction of the normal stresses at the middle of the finite shell for very early response times. However, the radial displacement response is four times as great for the 'ring' as for the finite shell and the fundamental frequency of the 'ring' is a seventh of that for the finite shell. The axial stress amplitude predicted by the 'ring' model is much smaller than that predicted by the finite-length model, and of course no edge effect is possible in the 'ring.' (Author)

AD-623 327 Div. 25/6 ,13/4 ,14/6
CFSTI Prices: HC $3.00 MF $0.75
STRUCTURAL MECHANICS RESEARCH LAB UNIV OF TEXAS AUSTIN
A STUDY OF THE INTERACTION OF CUSHIONING MATERIALS AND STRUCTURAL ELEMENTS,
by Mansour Nikkhah, Ned H. Burns, and J. Neils Thompson. Jul 65, 90p. Contract DA22 079eng393

Unclassified report

Descriptors: (*Concrete, Loading (Mechanics)), (*Impact shock, Distribution), Shock (Mechanics), Beams (Structural), Mathematical analysis, Dynamics, Energy, Structural parts, Vibration, Strain (Mechanics), Test equipment

The study extends the scope of previous investigations of the energy-dissipating characteristics of vermiculite concrete. Emphasis was given to interaction effects of a cushioning material and a structural element, and the behavior of materials to different dynamic loading systems. An experimental program was conducted on vermiculite concrete to simulate the interaction of a structural element and a cushion. Two different methods of applying dynamic loads were utilized in the study. To apply the results of the energy-dissipating materials studies to actual structural analysis, an analytical solution utilizing a numerical integration solution was employed. If the load pulse to which a structure is subjected and the resistance of the structure to motion due to this load are known or can be reasonably determined, this method of analysis can be used to predict the deflection response of the structure. Comparison of measured and predicted deflection responses for simple beams studied showed good agreement. (Author)

AD-623 337 Div. 25/6 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
MICHIGAN STATE UNIV EAST LANSING DEPT OF PHYSICS
TRANSPORT PROPERTIES OF SOLIDS.
Final technical rept. for 1 Mar 57-28 Feb 65. 28 Feb 65, 5p. Contract AF49 638 70 AFOSR , 65-1596

Unclassified report

Descriptors: (*Transport properties, Solids), Resistance (Electrical), Thermoelectricity, Semiconductors, Alloys, Magnetic properties, Field emission

A summary is given of work on the transport properties of solids, specifically on resistivity, thermoelectric power, related properties of metals and dilute alloys, and calculations on the properties of electrons in semiconductors.

AD-623 340 Div. 25/6 ,25/3 ,20/1
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
RESEARCH NOTES ON PHYSICS.
Annual rept. for 1 Oct 64-30 Sep 65, by Raymond L. Orbach, and Philip Pincus. 30 Sep 65, 11p. Contract Nonr23388 Proj. NR018 420

Unclassified report

Descriptors: (*Physics, Abstracting), Masers, Phonons, Excitation, Tunneling (Electronics), Superconductors, Vortices, Nuclear spins, Ferromagnetism, Antiferromagnetism, Phase studies, Magnetic resonance, Cryogenics

A summary is given of work conducted on the following topics: Spin-lattice relaxation in the E (2E) state of d3 ions in corundum; Phonon maser; Zeeman effect in the 517-518 transition in CaF2: Dy (2+); Tunneling into dirty superconductors near their upper critical fields; Vortex excitations in superfluid helium; Longitudinal nuclear spin-spin coupling in ferromagnets and antiferromagnets; Ultrasonic investigation of phase transitions; Magnetic resonance linewidth of gallium substituted EuIG; Third order anharmonic interactions of infrared phonons in alkali halides; Low temperature vibronic transitions in rock salt and silicon; Covalency parameters and the g factor for Ni (2+): K MgF3; Flux penetration in cylindrical superconducting films; Phonon induced corrections to Van Vleck temperature independent susceptibility; F19 nmr spin echos in antiferromagnetic MnF2; Magnetostatic modes in antiferromagnets and canted antiferromagnets; Non-linear phonon generation; Dynamical properties of induced moment systems.

AD-623 363 Div. 25/6 ,25/3
DELAWARE UNIV NEWARK DEPT OF PHYSICS
LAYER-LIKE FIELD INHOMOGENEITIES IN HOMOGENEOUS SEMICONDUCTORS IN THE RANGE OF 'N-SHAPED NEGATIVE DIFFERENTIAL CONDUCTIVITY',
by K. W. Boer. 22 Mar 65, 12p. Contract DA31 124ARO D Grant ,Nonr G433600 AROD , 4461:4

Unclassified report

Pub. in The Physical Review v139 n6A pA1949-59 Sep 13 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Semiconductors, Field theory), (*Transport properties, Semiconductors), Electric fields, Absorption spectrum, Electrical conductance, Voltage, Excitation, Quenching (Inhibition), Single crystals, Cadmium compounds, Sulfides

Characteristic layer-like field inhomogeneities are shown to occur in homogeneous semiconductors if the decrease in conductivity is stronger than linear with increasing field. These inhomogeneities are discussed generally in a model using Poisson and transport equations, and the fact that the neutral density of electrons and/or the mobility decreases with increasing field strength. The method of characteristics is used for discussion in order to facilitate analysis of the experimental observations. Further experimental results about layer-like field inhomogeneities in CdS concerning domain width and field strengths, influence of optical excitation and quenching, and net charging of CdS crystals are given and show good agreement with the proposed theory. (Author)

AD-623 397 Div. 25/6 ,25/3 ,25/4
CFSTI Prices: HC $3.00 MF $0.50
PURDUE UNIV LAFAYETTE IND DEPT OF PHYSICS
SEMICONDUCTOR RESEARCH.
Semiannual rept. for 1 Apr-30 Sep 65, by H. Y. Fan. 30 Sep 65, 55p. Contract DA31 124ARO D17 Proj. PRF3324

Unclassified report

Descriptors: (*Semiconductors, Electrical properties), Optical properties, Radiation damage, Low-temperature research, Electroluminescence, Ultrasonic properties, Heat treatment, Magnetic properties, Transport properties, Hall effect, Excitation, Paramagnetic resonance, Specific heat, Superconductivity

Contents: Electroluminescence Spikes in p-type GaSb; Ultrasonic amplification and intrinsic breakdown in InSb; Lithium diffusion and heat treatment of tellurium-doped n-GaSb; Weak field magnetoresistance in n-type aluminum antimonide; Transport measurements at moderate uniaxial and hydrostatic stresses, low temperatures, and large magnetic fields; Effect of stress on the resistivity and hall coefficient of aluminum antimonide; Effect of stress on the electrical properties of n-type GaAs; Effect of pressure on the electrical properties of n-type Silicon containing sulfur; Magnetoresistance of hop conduction in Ge; Excitation spectra of Group-V donors in silicon; Excitation spectra of donors in silicon-germanium alloys; Optical absorption of ZnTe; Electron paramagnetic resonance in electron irradiated germanium; Electron paramagnetic resonance in neutron irradiated silicon; Low temperature specific heat of reduced Ti02 (Rutile); Calorimetric study of vanadium in the superconducting, normal, and mixed states; Polaron in a magnetic field.

AD-623 528 Div. 25/6 ,14/2 ,15/2
CFSTI Prices: HC $5.00 MF $1.00
MICHIGAN UNIV ANN ARBOR DEPT OF CHEMICAL AND METALLURGICAL ENGINEERING
THE STRUCTURE AND PROPERTIES OF ORIENTED COMPOUND EUTECTICS.
Technical rept., by John William Moore. Aug 65, 173p. Rept. no. 05612-3-T
Contract Nonr 122447 Proj. NR032 478, ORA05612

Unclassified report

Doctoral thesis.

Descriptors: (*Eutectics, Crystal structure), (*Ceramic materials, Eutectics), Manganese compounds, Iron compounds, Oxides, Sulfides, Sodium compounds, Lithium compounds, Bromides, Chlorides, Fluorides, Phase studies, Crystallography, Thermal expansion, Hardness, Fracture (Mechanics), Microstructure, Deformation, X-ray defraction analysis

The study involved (1) the preparation of unidirectionally solidified eutectic ingots of MnO-MnS, FeO-FeS, NaC1-NaF, NaBr-NaF and LiF-NaF, (2) the determination of the crystallographic orientation of each phase with respect to the direction of solidification and the planar interface between the phases, (3) the measurement of the thermal expansion of the MnO-MnS eutectic and the MnS phase, (4) the determination of the slip modes, fracture characteristics and directional indentation hardness of the MnO-MnS eutectic and the MnO phase, and (5) the comparison of the measured properties of the lamellar MnO-MnS eutectic with those of the MnO and MnS phases.

AD-623 544 Div. 25/6
SYRACUSE UNIV N Y DEPT OF MECHANICAL ENGINEERING

INTERACTION OF CRITICAL PRESSURES AND CRITICAL CONCENTRATED LOADS ACTING ON SHALLOW SPHERICAL SHELLS,
by Ta-Cheng Loo, and R. M. Evan-Iwanowski.
30 Jun 65, 5p. Rept. no. 65-WA/APM-27
Contract DA ARO D31 124 61G24
AROD , 2465:11

Unclassified report

Pub. in Journal of Applied Mechanics nd (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spheres, Loading (Mechanics)), (*Structural shells, Loading (Mechanics)), Pressure, Functions, Stresses, Buckling (Mechanics)

The critical combinations of uniform pressures and concentrated loads at the apex acting on shallow spherical shells were determined analytically and experimentally. The Dini-Bessel expansion of unknown functions was applied to the problem on hand. Test specimens void of initial geometrical imperfections and negligible residual stresses were fabricated in the laboratory by using the die-pressing technique. The analytically calculated critical combinations are in good agreement with those determined experimentally. The theoretical lower-bound, or the cut-off values, of the geometry parameter, mu, is found to be near the experimental values. The existence of the analytical and experimental cut-off values of gamma 2 indicates that there is a lower bound of the values of uniform pressures such that a shell does not exhibit a snap-through instability when subjected for any combinations of concentrated loads and uniform pressures below its cut-off value. (Author)

AD-623 595 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
ELASTIC BUCKLING TESTS ON LATERALLY AND TORSIONALLY BRACED TAPERED I-BEAMS.
Technical rept.,
by Donald J. Butler. Sep 65, 39p. Rept. no. TR-2
Contract NBy24967

Unclassified report

Descriptors: (*Cantilever beams, Buckling (Mechanics)), (*Buckling (Mechanics), Cantilever beams), Reinforcing materials, Flanges, Structural properties, Loading (Mechanics), Steel, Beams (Structural)

Presented, are the results of an experimental investigation which studied the influence of lateral and torsional bracing on the elastic buckling strength of tip loaded, tapered, cantilever I-beams. The principal conclusions may be summarized as follows: A single lateral brace at the free end of the beam should be applied to the top (tension) flange for greatest effect. The most effective combination of end lateral brace and midspan lateral brace consists of an end brace on the top flange and a midspan brace on the bottom flange. Intermediate bracing on the top flange has very little influence on the strength of the beam. Relatively modest torsional bracing effectively inhibits lateral buckling; e.g., a typical roof purlin which might be connected to such members would provide sufficient resistance to twist to achieve full or nearly full torsional bracing. (Author)

AD-623 602 Div. 25/6
POULTER LABS STANFORD RESEARCH INST MENLO PARK CALIF
RIGID-PLASTIC BEAMS UNDER UNIFORMLY DISTRIBUTED IMPULSES,
by A. L. Florence, and R. D. Firth. 1965, 9p.
Contract AF29 601 4329

Unclassified report

Pub. in Journal of Applies Mechanics Sep 1965 (Copies not available to DDC or Clearinghouse customers). Prepared for presentation at Applied Mechanics/Fluids Engineering Conference, Washington, D. C., 7-9 Jun 65, of American Society of Mechanical Engineers.

Descriptors: (*Beams (Structural), Deformation), Geometric forms, Theory, Hardening

The paper contains the description and results of experiments in which pinned and clamped beams are subjected to uniformly distributed impulses large enough to cause considerable plastic deformation. The final permanent shapes are compared with those predicted by the rigid-plastic theory. They are also compared with the shapes predicted when the theory takes some account of large deflections and strainhardening. (Author)

AD-623 605 Div. 25/6
POULTER LABS STANFORD RESEARCH INST MENLO PARK CALIF
ANNULAR PLATE UNDER A TRANSVERSE LINE IMPULSE,
by Alexander L. Florence. 2 Apr 65, 9p. Contract AF29 601 4329

Unclassified report

Pub. in AAIA Journal v3 n9 p1726-32 Sep 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Disks, Deformation), (*Membranes, Deformation), (*Structural parts, Stresses), Mathematical analysis, Loading (Mechanics)

The paper contains three approximate solutions for finding the permanent edge deflection of an annular plate. The plate, clamped at the inner boundary, free at the outer, is subjected to a uniform transverse impulse on a narrow annular area at the outer edge. The material is assumed to have a rigid-plastic behavior and to deform according to the Tresca yield condition and associated flow rule. Since the problem is complicated when bending and membrane actions are included, it is represented as one of three less complicated subproblems, each of which is then made tractable by means of approximations. In the first of these, the usual procedure of considering bending alone is adopted. In the second, yielding is assumed to occur in the form of a limited interaction, that between the circumferential components of bending moment and membrane force. In the third, membrane forces alone are considered. Finally, experiments are described, and the results in the form of plate edge deflections are compared with the three different theoretical predictions. For large deflections, results indicate a great improvement over the bending theory when membrane action is included. (Author)

AD-623 612 Div. 25/6 ,25/4
LINCOLN LAB MASS INST OF TECH LEXINGTON
QUENCHING OF DY (+2) FLUORESCENCE BY Y (+2) IN CAF2:DY (+2) LASERS,
by J. R. O'Connor. 1 Jun 65, 2p.

Unclassified report

Pub. in Applied Physics Letters v7 n3 p54-5 Aug 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Impurities), (*Fluorescence, Quenching (Inhibition)), (*Dysprosium, Fluorescence), Yttrium, Atomic energy levels, Calcium compounds, Fluorides, Single crystals, Photons

It is shown that Y (+2) (4d1) quenches the fluorescence of Dy (+2) (4f10) and therefore raises the threshold for laser action.

AD-623 638 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS MATERIALS ENGINEERING DIV
TRANSITION SOLUTIONS FOR AXISYMMETRIC SHELL VIBRATIONS.
Technical rept.,
by Edward W. Ross,Jr.. Oct 65, 38p. Rept. no. amra-TR-65-27
Proj. DA1P014501B33A Task 36911

Unclassified report

Descriptors: (*Structural shells, Vibration), (*Elastic shells, Vibration), Differential equations, Numerical analysis

The report describes an investigation of the solutions of a sixth-order linear, ordinary differential equation system near a transition point in their asymptotic representations. The system is the one which describes the small, axisymmetric vibrations of an elastic thin shell. Representations valid in the transition region are found for all six solutions, connection formulas are stated, and the possibility of uniform asymptotic approximations is discussed briefly. (Author)

AD-623 649 Div. 25/6
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SOLID STATE SCIENCES LAB
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONYBENZOIC ACID.
Physical sciences research papers,
by Marvin S. Brooks, and Willard R. Hancock.
Oct 65, 88p. Rept. no. PSRP-148
Proj. 5620 Task 562001
AFCRL , 65-712

Unclassified report

Descriptors: (*Zone melting, Tracer studies), (*Metalorganic compounds, Zone melting), (*Antimony compounds, Zone melting), (*Benzoates, Zone melting), Non-destructive testing, Labeled substances, Purification, Mathematical models, Phase studies, Eutectics

An experimental study on the zone refining of the binary system triphenyl antimony-benzoic acid is described. The isotope Sb124, which is a strong gamma emitter, was employed as a tracer; this allowed a rapid in situ nondestructive analysis, closely spaced experimental points, and the opportunity to study distribution as a function of varying experimental conditions. With the aid of computers (IBM 7090 and IBM 7044) apparent k's were calculated and the experimental data compared with those predicted from various mathematical models. (Author)

AD-623 668 Div. 25/6 ,25/7
PURDUE UNIV LAFAYETTE IND
IMPURITY AND EXCITON EFFECTS ON THE INFRARED ABSORPTION EDGES OF III-V COMPOUNDS,
by E. J. Johnson, and H. Y. Fan. 8 Apr 65, 11p.

Unclassified report

Pub. in The Physical Review v139 n6A pA1991-A2001 Sep 13 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Lincoln Lab., Mass. Inst. of Tech., Lexington.

Descriptors: (*Absorption spectrum, Semiconductors), (*Semiconductors, Spectra (Infrared)), Impurities, Band spectrum, Electron transitions, Magnetic properties, Lasers, Cryogenics, Intermetallic compounds, Gallium alloys, Antimony alloys, Indium alloys

The fundamental absorption edge of each of several III-V compounds was examined for structure due to excitons and impurities using high resolution and sample temperatures down to 1.4K. The effects of an applied magnetic field were studied. The absorption edge of GaSb shows three sharp peaks (a, b, c) and a lowabsorption tail. Under a magnetic field, the peaks (a, b, c) shift and split in

a manner close to the expected behavior of the exciton. The peak a is shown to be the free-exciton peak and the peaks (b and c) are attributed to impurity-exciton complexes. The tail is found to be associated with electron transitions to the conduction band from impurity levels near the valence band. Absorption associated with impurity-valence-band transitions is also observed at low photon energies. Analysis of these results gives the energy gap, the electron g factor, and the ionization energies of impurity levels. The absorption edge of InSb shows a step which is found to be due to ionized acceptors. Under a magnetic field, two peaks develop from the step absorption which behave like the impurity-exciton peaks in GaSb. The optical transitions involved appear to be related to the emission observed in the InSb laser. The electron g factor and the ionization energies of impurity levels have been estimated from these results. Some studies on the impurity absorption near the intrinsic edge of other III-V compounds are reported. (Author)

AD-623 138 See Fld. 9/1

AD-623 165 See Fld. 7/2

AD-623 274 See Fld. 12/1

AD-623 313 See Fld. 7/4

AD-623 404 See Fld. 20/3

AD-623 501 See Fld. 8/7

AD-623 509 See Fld. 20

AD-623 510 See Fld. 9/1

AD-623 530 See Fld. 20/3

AD-623 560 See Fld. 13/13

AD-623 566 See Fld. 11/6

AD-623 567 See Fld. 11/6

AD-623 573 See Fld. 20/3

AD-623 624 See Fld. 20/6

AD-623 642 See Fld. 12/1

AD-623 651 See Fld. 5/1

AD-623 665 See Fld. 13/9

20/13. THERMODYNAMICS

AD-623 198 Div. 25/8 ,4/4
NORTHWESTERN UNIV EVANSTON ILL
THE VISCOSITY OF ARGON, KRYPTON, AND XENON IN THE DENSE GASEOUS REGION,
by E. G. Reynes, and G. Thodos. 21 Jan 64, 14p.
Contract AF AFOSR45 63 Proj. 9750 Task 975001
AFOSR , 65-1477

Unclassified report

Pub. in Physica v30 p1529-42 1964 (Copies available only to DDC users).

Descriptors: (*Argon, Viscosity), (*Krypton, Viscosity), (*Xenon, Viscosity), (*High-pressure research, Helium group gases), Density, Fluid flow, Viscosimeters

The effect of pressure on the viscosity of argon, krypton, and xenon was established experimentally for pressures ranging up to 820 atm at 100, 150, and 200C. For xenon additional measurements were carried out at 50C. These measurements were made using an unsteady flow transpiration type capillary viscometer, whose basic dimensions were accounted for in order to operate it in an absolute manner. The residual viscosities resulting from these measurements were normalized to produce values which correlated with the corresponding reduced density to produce a single continuous function for these three monatomic gases. (Author)

AD-623 199 Div. 25/8 ,9/1
KANSAS STATE UNIV MANHATTAN
FINITE DIFFERENCE ANALYSIS OF FORCED-CONVECTION HEAT TRANSFER IN ENTRANCE REGION OF A FLAT RECTANGULAR DUCT,
by Ching-Lai Hwang, and Liang-Tseng Fan. 17 Jun 63, 22p.
AFOSR , 65-1481

Unclassified report

Pub. in Appl. sci. Res. v13 sect. A p401-22 (Copies available only to DDC users).

Descriptors: (*Heat transfer, Ducts), (*Convection, Heat transfer), Rectangular bodies, Taminar flow, Difference equations, Numerical methods and procedures, Momentum, Energy

The laminar forced convection heat transfer in the entrance region of a flat rectangular duct is studied. In this region temperature and velocity profiles are simultaneously developed. The basic governing equations of momentum, continuity, and energy are expressed in finite difference form and solved numerically by use of a high speed computer for a mesh network superimposed on the flow field. All fluid properties are assumed to be constant. The cases of uniform constant wall temperature and of uniform constant heat flux from wall to fluid are considered. Nusselt numbers are reported for Prandtl numbers in the range of 0.01 to 50. The exact solution of the energy equation obtained by means of the numerical method is compared with the results of approximate solutions. (Author)

AD-623 398 Div. 25/8 ,15/1 ,25/5
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE
PATH INTEGRAL CALCULATION OF THE TWOPARTICLE SLATER SUM FOR HE4,
by Lloyd D. Fosdick, and Harry F. Jordan. 20 Aug 65, 44p. Rept. no. 186
Contract Nonr183427

Unclassified report

Descriptors: (*Kinetic theory, Helium), (*Integrals, Kinetic theory), (*Quantum statistics, Integrals), (*Helium, Kinetic theory), Equations of State, Statistical mechanics, Thermodynamics, Cryogenics, Potential theory, Monte Carlo method, Sampling

The Wiener integral formulation combined with Monte Carlo sampling has been used to compute the two-particle Slater sum for He4 for temperatures ranging from 273K down to 2K, the lower practical limit for this computational method. This is equivalent to a calculation of the density independent part of the pair distribution function. A Lennard-Jones 6-12 potential has been used to describe the interaction. Contributions from exchange were found negligible at 5K and above. Comparisons with the WignerKirkwood expansion are made. The second virial coefficients derived from these results are within two per cent or three per cent of the results obtained from the usual phase shift calculation. (Author)

AD-623 542 Div. 25/8
CHICAGO UNIV ILL DEPT OF PHYSICS
IS THERE A FUNDAMENTAL DIFFERENCE BETWEEN A LIQUID AND GAS,
by D. H. Douglass,Jr.. 1 Apr 65, 8p.
AROD , 4184:5

Unclassified report

Pub. in Physics v1 n6 p329-35 1965 (Copies available only to DDC users).

Descriptors: (*Phase studies, Fluids), (*Gases, Phase studies), (*Liquids, Phase studies), Transition temperature, Pressure, Temperature, Compressive properties, Thermodynamics

Operationally, an extension of the liquid-gas equilibrium curve above the classical critical point can be defined. The existence of such a line may mean that there is a fundamental difference between a liquid and a gas. (Author)

AD-623 617 Div. 25/8 ,9/1
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
EFFECT OF VIBRATION ON HEAT TRANSFER FROM CYLINDERS VIBRATED SINUSOIDALLY WITHIN A VERTICAL PLANE IN FREE CONVECTION.
Master's thesis,
by William J. Watson. 1965, 59p. Rept. no. GAW/ME/65/3

Unclassified report

Descriptors: (*Cylindrical bodies, Heat transfer), (*Heat transfer, Vibration), Convection, Reynolds number, Boundary layer

Methods to increase the heat transfer rate from a body to its surroundings include the effects of vibration. The study is an investigation of the effect of sinusoidal vibration in a vertical plane on the heat transfer rate from a cylinder in free convection in air. Three different cylinders with diameters 0.072 in, 0.120 in, and 0.25 in were vibrated at amplitudes from 0 to 1.5 in, at frequencies from 16 to 80 cps, and at surface temperatures of 100F and 200F above room temperature. The heat transfer rate changes from that obtained in a free convection process to that obtained in a forced convection process at the conventional forced convection curve of McAdams and generally parallels this curve to Reynolds numbers as high as 1100 which was the highest obtained. For a given Reynolds number, the heat transfer rate is independent of the cylinder temperature and test position along the length of the cylinder. The results of this investigation agree closely with results previously presented for cylinders vibrated in free convection in air, regardless of the mode or method of vibration. The scope of the investigation was limited by vibrating characteristics of the cylinders, failure of the cylinders at higher temperatures, and the limited mass of the mounting assembly for the cylinders. (Author)

AD-623 099 See Fld. 14/2

AD-623 114 See Fld. 20/3

20/14. WAVE PROPAGATION

AD-623 123 Div. 8/6
CFSTI Prices: HC $2.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF ELECTRICAL ENGINEERING
TRANSMISSION LOSSES OF HYBRID SURFACE WAVES ON THE V-LINE.
Scientific rept.,

by P. Diament, S. L. Richter, and S. P. Schlesinger
12 Jul 65, 38p. Rept. no. CU-12-65-AF-2461-EE ,SR-84
Contract AF19 628 2461 Proj. 4600 Task 460004
AFCRL , 65-557

Unclassified report

Descriptors: (*Transmission lines, Wave transmission), (*Electromagnetic waves, Propagation), Waveguides, Antennas, Dielectrics, Cylindrical bodies, Attenuation, Wedges, Electrical conductance, Bessel functions, Integrals

Transmission losses of the V-line, a surface wave guiding structure comprising a cylindrical dielectric binding medium of sectoral cross section supported by a wedge formed by two conducting plates, are considered. Analytic expressions for both the dielectric and conduction losses are derived for the hybrid modes and presented graphically. On the basis of these, criteria are given for minimizing the attenuation due to both losses. Included are methods to calculate intractable integrals of products of modified Bessel functions to high accuracy. (Author)

AD-623 291 Div. 8/6 ,5/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
AN INVESTIGATION OF THE MODAL INTERFERENCE OF VERY-LOW-FREQUENCY RADIO WAVES.
Final rept.,
by F. J. Rhoads, and W. E. Garner. 27 Oct 65, 65p. Rept. no. NRL-6359
Proj. BuShips SR008 01 01 Task 7044

Unclassified report

Descriptors: (*Radio waves, Propagation), (*Very low frequency, Radio transmission), (*Radio communication systems, Wave transmission), Radio transmitters, Global communication systems, Ionospheric propagation, Radio signals, Radio fields, Intensity, Measurement, Airborne, Radio receivers

A very-low-frequency (vlf) radio-wave propagation experiment has been designed to study modal interference effects and the extent of agreement with theoretical results obtained previously. The experimental data are the field strengths of the vlf transmissions from the U. S. Navy transmitting stations NPM and Haiku in Hawaii and NPG near Seattle, Washington. These data were recorded aboard an aircraft while in flight between California, Guam, and Japan, and also at a field site near Washington, D. C. During the experiment, NPM transmitted for various periods on 16.6, 19.8, 22.3, 24.0, and 26.1 kc/s. The Haiku transmissions were on 16.6 and 19.8 kc/s, while NPG was on 18.6 kc/s continuously. The experimental field-strength-versus-distance graphs show considerable modal interference and very good agreement with the theoretical results for the isotropic case. For frequencies above 20 kc/s the experimental data indicate the existence of at least the first three modes for propagation to the west and to the east, out to distances greater than 3 megameters. The data at 19.8 kc/s, however, indicate first-three-mode effects for propagation to the east but only two modes to the west. The fading of the field strengths at Washington, D. C., during sunrise was frequently greater than 20 db. The depth of the fades, in general, increased with frequency, whereas their time of occurrence was relatively independent of frequency over the range of 19.8 to 26.1 kc/s. (Author)

AD-623 351 Div. 8/6 ,25/4 ,8/3
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
SURVEY OF SOME EARLY STUDIES OF THE SCATTERING OF PLANE WAVES BY A SPHERE.
Revised ed.,
by Nelson A. Logan. 22 Apr 65, 13p. Contract AF19 628 4393

Unclassified report

Pub. in Proceedings of the IEEE v53 n8 p773-85 Aug 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 24 Feb 65.

Descriptors: (*Electromagnetic waves, Scattering), (*Scattering, Reviews), (*Spheres, Scattering), Light, Particles, Diffraction, Propagation, Boundary value problems

The survey of the literature prior to World War II shows that the study of the scattering of plane waves by a sphere has a history in which the list of contributors includes some of the greates names in mathematical physics from the late nineteenth and early twentieth centuries. When viewed in retrospect, this literature appears to be characterized by the appearance of papers by writers who apparently failed to appreciate the significance of the contributions made by their contemporaries and predecessors. Emphasis is placed upon the relatively unknown contributions of Clebsch, Norenz, Nicholson, Bromwich, Proudman, Boodson, Kennedy, and White. The uncovering of the 'lost' contributions of these writers serve to enrich the historical perspective against which one should view the voluminous literature which has accrued since World War II. (Author)

AD-623 545 Div. 8/6 ,6/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
UHF AEW RADAR OBSERVATIONS OF ELEVATED TRADEWIND DUCTS.
Final rept.,
by D. F. Hemenway. 10 Sep 65, 26p. Rept. no. NRL-6322
Proj. RR008 01 41 5550 ,RAV53R005 6521 F001 02 002

Unclassified report

Descriptors: (*Radar signals, Ionospheric propagation), (*Ionospheric propagation, Radar signals), (*Ultrahigh frequency, Radar signals), Atmospheric motions, Waveguides, Jet stream (Meteorology), Electromagnetic waves, Propagation, Radar tracking, Airborne, Radar equipment

Airborne uhf (435-Mc/s) propagation paths observed during the course of a 12-month study of elevated tradewind ducts (Project TRADEWINDS IV) varied from 240 to 1200 nautical miles (naut mi) as compared with less than 180 naut mi observed for the same system in a standard atmospheric propagation medium. Out of 18 flights spaced over a year, 17 (94 percent) resulted in the radar detection of elevated ducts. Ten flights (55 percent) resulted in the discovery of ducts which permitted the radar detection of targets at ranges in excess of 500 naut mi. Radar data has been obtained which shows that the elevated ducts off the southern California coast can have an extent in longitude in excess of 1200 naut mi and a latitudinal extent of greater than 1000 naut mi. Average attenuation rates as low as 4 db/100 naut mi have been observed for pathlengths of over 1000 naut mi. The existence of ducts off the California coast capable of sustaining long range radio-radar propagation was not limited to the summer months. On the basis of data obtained during the 12-month study, there is evidence that the occurrence, strength, and extent of the ducts does not change significantly with the seasons of the year. The airborne uhf radar has proved to be a useful tool for the detection and observation of elevated ducts. Through the observation of ducting radar return signals, it was possible to determine the number, relative strength, height, and the thickness of elevated ducts. (Author)

AD-623 580 Div. 8/6 ,2/7
CFSTI Prices: HC $4.00 MF $1.00
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
AN INVESTIGATION OF LARGE-SCALE IONOSPHERIC DISTURBANCES OBSERVED IN A RADIOLOCATION EXPERIMENT.
Technical rept.,
by David G. Detert. Sep 65, 138p. Rept. no. RRL-288 ,TR-28
Contract Nonr183402

Unclassified report

Descriptors: (*Ionospheric disturbances, Radio interference), (*Direction finding, Radio signals), Electron density, Angle of arrival, Periodic variations, Atmosphere models, Azimuth

Measurements of the azimuthal and vertical angles of arrival were made during the afternoon and early evening on pulse transmissions at 5 mcs over a 452 km east to west path using a six-element interferometer antenna system. The large systematic variations appearing in rapid time series measurements are shown to be due to the passage of large-scale traveling ionospheric disturbances through the transmission path. A model is proposed for these perturbations, consisting of a long front whose cross section is elliptically elongated in the horizontal direction and whose interior contains an increase or decrease of electron density over the background profile valuuues. The angle of arrival variations which should be characteristic of the passage of such irregularities are developed. The variations are seen to be dependent on the direction of travel of the disturbances, and data samples showing each of the several characteristic variations are presented. Vertical incidence swept-frequency ionospheric soundings taken at one minute intervals at both the midpoint and receiving endpoint of the path are used to confirm the identification of the particular disturbance for each of these samples.

AD-623 646 Div. 8/6 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
CHARACTERISTIC WAVE CATALOGUING FOR RAY PATH DETERMINATION.
Physical sciences research papers,
by Yuji Inoue, and Sameul Horowitz. Sep 65, 34p. Rept. no. PSRP-137
Proj. 5631 Task 563109
AFCRL , 65-693

Unclassified report

Descriptors: (*Radio transmission, Ionospheric propagation), Plasma medium, Refractive index, Radio waves, Electron density, Terrestrial magnetism, Polarization, Complex variables

Wave cataloguing suitable for ray tracing of a pulsed wave packet in a weakly-dissipative, horizontallystratified magnetoionic medium is described, Particular attention is devoted to the cataloguing of the various characteristic waves so that the influence of the local ionization density and collision frequency can be understood. The procedure presented is applicable under general incident conditions and complex refractive index surfaces. The Booker quartic equation is used to derive the unambiguous wave normals and wave identification is obtained from the dispersion equation. A modified CMA. diagram including collisions is illustrated. (Author)

AD-623 647 Div. 8/6 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
MAGNETO-IONIC COUPLING IN AN INHOMOGENEOUS MEDIUM.
Physical sciences research papers,
by Yuji Inoue, and Samuel Horowitz. Sep 65, 41p. Rept. no. PSRP-138
Proj. 5631 Task 563109
AFCRL , 65-694

Unclassified report

Descriptors: (*Electromagnetic waves, Plasma medium), (*Wave transmission, Partial differential equations), Ionospheric propagation, Radio waves, Field theory, Atmosphere models, Tensor analysis, Matrix algebra

The propagation of electromagnetic waves in a horizontally stratified layer of gyrotropic medium is discussed. Derivation of a comprehensive representation for magneto-ionic coupling coefficients allows interpretation of the physical significance of the coupling. Introduction of an invariant quantity for an inhomogeneous medium becomes an important guide for numerical solutions of the wave equation. Numerical results of magneto-ionic coupling coefficients are presented. Based on region properties, characteristic wave types are defined: for the isotropic region, linearly polarized waves are used; for the anisotropic region, elliptically polarized waves generally are applied. (Author)

AD-623 648 Div. 8/6 ,25/3 ,25/5
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
A DISCUSSION OF THE WHEELER-FEYNMAN ABSORBER THEORY OF RADIATION.
Physical sciences research papers,
by Ronald G. Newburgh. Oct 65, 27p. Rept. no. PSRP-154
Proj. 6688 Task 668801
AFCRL , 65-752

Unclassified report

Descriptors: (*Field theory, Charged particles), (*Charged particles, Acceleration), Electromagnetic waves, Absorption, Potential theory, Relativity theory, Momentum, Electrons, Hydrogen

The Wheeler-Feynman absorber theory of radiation is reviewed. A proof is offered to show that a sum of advanced and retarded effects from the absorber can provide the origin of radiative reaction. This proof is different from and perhaps simpler than that of Wheeler and Feynman. From arguments of momentum and energy conservation the necessity of the absorber for the emission of radiation is demonstrated for three cases. (Author)

AD-623 655 Div. 8/6 ,8/1 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS ANTENNA LAB
TE-WAVE SCATTERING BY A DIELECTRIC CYLINDER OF ARBITRARY CROSS-SECTION SHAPE,
by Jack H. Richmond. 10 Jul 65, 32p. Rept. no. 1804-5
Contract NOw64 0293d

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electromagnetic waves, Scattering), (*Field theory, Dielectrics), (*Antenna radiation patterns, Dielectrics), Cylindrical bodies, Polarization, Electric fields, Programming (Computers), Antenna configurations

The theory and equations are developed for the scattering pattern of a dielectric cylinder of infinite length and arbitrary cross-section shape. The harmonic incident wave is assumed to have its electric vector perpendicular to the axis of the cylinder, and the fields are assumed to have no variations along this axis. Although some investigators have approximated the field within the dielectric body by the incident field, a more accurate solution is obtained here by treating the total field as an unknown function which is determined by solving a system of linear equations. Scattering patterns obtained by this method are presented for dielectric shells of circular and semicircular cross-section, and for a thin plane dielectric slab of finite width. The results for the circular shell agree accurately with the exact classical solution. The effects of surface-wave excitation and mutual interaction among the various portions of the shell are included automatically in this solution. (Author)

AD-623 657 Div. 8/6
CFSTI Prices: HC $3.00 MF $0.50
CHALMERS UNIV OF TECHNOLOGY GOTEBORG (SWEDEN) RESEARCH LAB OF ELECTRONICS
STIMULATED SCATTERING FROM A SEMI-INFINITE DISPERSIVE MEDIUM PERIODIC IN TIME AND SPACE.
Research rept. and Technical note,
by J. Askne. 1 Jun 65, 53p. Rept. no. RR-53,TN-US-43
Contract AF61 052 451
AFCRL , 65-689

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electromagnetic waves, Scattering), (*Pumping (Electronics), Electromagnetic waves), Polarization, Plasma oscillations, Ionospheric propagation, Lasers, Time, Electron density, Propagation, Equations, Radio waves, Sweden

The problem of wave interactions in a dispersive medium with a density periodic in time and space due to a high power pump wave, is treated. Waves are shown to be caused by both scattering and boundary processes. Conditions for parametric traveling wave resonance are found. Generalized Fresnel formulas are given for parallel and perpendicular polarization. (Author)

AD-623 670 Div. 8/6
CFSTI Prices: HC $1.00 MF $0.50
ROME UNIV (ITALY) ISTITUTO DI ELETTRONICA
RECTANGULAR GUIDES LOADED WITH MAGNETIZED FERRITE AND THE SO-CALLED THERMODYNAMIC PARADOX.
Interim scientific rept. no. 2,
by Giorgio Barzilai, and Giorgio Gerosa. 28 Jul 65, 12p. Contract AF61 052 807
\FCRL , 65-781

Unclassified report

Presented at the International Conference on the Microwave Behaviour of Ferromagnetics and Plasmas, London, 13-17 Sep 65. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-617 742.

Descriptors: (*Waveguides, Ferromagnetic materials), (*Wave transmission, Waveguides), Mathematical analysis, Electric fields, Magnetic fields, Surface properties, Boundary value problems

The so-called thermodynamic paradox associated with a ferrite loaded rectangular waveguide is discussed. It is shown that various structures introduced by some authors to resolve the paradox are, even in the limit case, different structures from the original one leading to the paradox and therefore they do not help in the resolution of the apparent inconsistency. Some experiments have been carried out in order to explain how in a physical structure the power is actually dissipated. (Author)

AD-623 146 See Fld. 9/5

AD-623 259 See Fld. 4/2

AD-623 371 See Fld. 17/9

AD-623 463 See Fld. 20/6

AD-623 471 See Fld. 4/2

AD-623 673 See Fld. 3/1

21/2. COMBUSTION AND IGNITION

AD-623 186 Div. 10/7 ,10/6
CFSTI Prices: HC $3.00 MF $0.75
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
AFOSR COMBINED CONTRACTORS MEETING ON COMBUSTION DYNAMICS RESEARCH, JUNE 1 - 4, 1965.
Abstracts.
1965, 77p. Contract AF49 638 1505
AFOSR , 65-0590

Unclassified report

Descriptors: (*Combustion, Dynamics), Solid rocket propellants, Solid rocket oxidizers, Rocket motors, Plasma medium, Propulsion, Detonation waves, Supersonic flow, Hydrogen, Fuels, Oxygen, Flame propagation, Ignition, Deflagration, Sodium compounds, Borates, Ammonium compounds, Perchlorates, Liquid jets, Symposia

AD-623 331 Div. 10/7 ,9/1 ,9/6
CFSTI Prices: HC $3.00 MF $0.50
AEROSPACE CORP SAN BERNARDINO CALIF
NONEQUILIBRIUM ANOMALIES IN THE DEVELOPMENT OF DIFFUSION FLAMES,
by P. M. Chung, F. E. Fendell, and J. F. Holt.
Sep 65, 52p. Rept. no. TDR-669 (S6951-90)-1
Contract AF04 695 669
BSD , TR-65-448

Unclassified report

Descriptors: (*Flames, Nonequilibrium flow), (*Stagnation point, Flames), (*Nonequilibrium flow, Flames), Diffusion, Fuel sprays, Jet mixing flow, Oxidizers, Blunt bodies, Chemical equilibrium, Ignition, Frozen equillibrium flow, Combustion, Burning rate, Boundary layer transition

The development of diffusion flame is analyzed for the stagnation mixing layer created by a jet of fuel injected into the oncoming stream of oxidant at the stagnation region of blunt body. From the analysis, the conditions which distinguish the simple and multiple transitions, from each other, between frozen and equilibrium chemical states were clarified. Though the actual numerical results were obtained for the stagnation mixing layer geometry, the basic findings of the analysis should hold for other diffusion flames also. (Author)

AD-623 401 Div. 10/7 ,10/4 ,10/5
CFSTI Prices: HC $4.00 MF $1.00
ROCKETDYNE CANOGA PARK CALIF
STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART II: ANALYSIS FOR COAXIAL JET INJECTION.
Research rept.,
by L. P. Combs, and M. D. Schuman. Mar 65, 134p. Rept. no. RR-64-29
Contract AF49 638 817 Proj. 9751
AFOSR , 65-1319

Unclassified report

See also AD-615 798.

Descriptors: (*Rocket propellants, Combustion), (*Hydrogen, Combustion), (*Oxygen, Combustion), (*Combustion, Rocket propellants), Liquefied gases, Gaseous rocket propellants, Liquid rocket oxidizers, Fuel injection, Atomization, Jet mixing flow, Vaporiza-

tion, Flames, Turbulence, Mathematical analysis, Thermodynamics, Transport properties

Simultaneous equations describing rocket propellant injection, atomization, mixing, vaporization, and combustion are formulated for a cylindrical liquid oxygen jet surrounded by an annular gaseous hydrogen stream. The formulation is based on division of the combustion chamber into a nonburning region near the injector and a combustion region further downstream. Processes in the nonburning region are required to satisfy certain combustibility criteria before combustion is possible. The propellants then pass through a plane flame front into the combustion region. A simplified treatment of turbulent mixing between unlike reacting gas streams, one of which contains a liquid oxygen spray, characterizes the combustion region model. Solutions of the system of equations, obtained with a digital computer program, are detailed, discussed, and compared favorably with experimental information from Part I. (Author)

AD-623 402 Div. 10/7 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
MIDWEST RESEARCH INST KANSAS CITY MO
MASS SPECTROMETER STUDY OF METAL-CONTAINING FLAMES.
Quarterly technical summary rept. no. 16, 1 Jul30 Sep 65,
by Thomas A. Milne. 30 Sep 65, 14p. Contract Nonr359900 Proj. MRI 2551P,ARPA Order 23-63 amend. 38

Unclassified report

See also AD-451 076.

Descriptors: (*Flames, Mass spectrum), (*Mass spectroscopy, Flames), (*Titanium, Flames), Cyanogen, Oxygen, Combustion, Carbon dioxide, Dissociation, Additives, Chlorides, Samplers, Methane, Inhibition, Halogenated hydrocarbons, Bromine compounds, Thermochemistry, Nucleation, Molecular beams, Reaction kinetcis

Cyanogen-oxygen flames have been sampled at one atmosphere at temperatures such that the 02 and C02 are largely dissociated. Addition of TiC14 to such flames has allowed the observation of TiO (+) and C1 (+) but under conditions which suggest that they arise largely from TiOC1 (g) transpired from the oxide deposited on the cold probe. A study of beam formation from cones with apex angles from 90 degrees to 30 degrees was made. Serious intensity attenuation was observed with angles sharper than 60 degrees. Sharpedged, 90 degrees, cooled, stainless steel cones, 1/2-in. long, produced strong beams, and it was possible to probe the reaction zones of lean, CH4-02, 1/20 atmosphere flames without serious disturbance. Preliminary profiles through such flames, with and without CH3Br inhibitor, are discussed. (Author)

21/4. FUELS

AD-623 241 See Fld. 11/8

AD-623 248 See Fld. 11/8

21/5. JET AND GAS TURBINE ENGINES

AD-623 211 Div. 27/2
CFSTI Prices: HC $3.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SPECTRA OF IRREGULARITIES OF A PROCESSED SURFACE, AND THEIR EFFECT ON THE LIFE OF TURBINE BLADES OF GAS-TURBINE ENGINES,
by I. V. Dunin-Barkovskii, and S. Kh. Tupeev. 20 Oct 65, 51p. Rept. no. FTD-TT-65-1486 TT , 65-64429

Unclassified report

Unedited rough draft trans. of Aviatsionnyi Tekhnologicheskii Institut, Moscow. Trudy (USSR) v60 p72-107 1964. Available copy will not permit fully legible reproduction.

Descriptors: (*Gas turbine blades, Surface properties), Gas turbines, USSR, Spectroscopy, Life expectancy, Stresses, Hardening, Mechanical working, Rotor blades (Turbomachinery)

An examination is made of the effect of irregularities in the profile of processed surfaces on the life of blades; taking into account the effect of residual stresses, and the degree and depth of propagation of work hardening. The influence of certain technological factors on surface profile irregularities is explained.

AD-623 491 Div. 27/2 ,30/5
CFSTI Prices: HC $4.00 MF $0.75
GENERAL ELECTRIC CO CINCINNATI OHIO APPLIED RESEARCH AND AERODYNAMICS DESIGN OPERATION
MODEL FREON COMPRESSOR FOR ACOUSTIC INVESTIGATIONS.
Technical rept.,
by R. J. Wells, and J. M. McGrew. Jun 65, 110p. Contract FA64WA5034
FAA-ADS , 47

Unclassified report

Descriptors: (*Axial-flow compressors, Model tests), (*Compressor noise, Test methods), Feasibility studies, Sound, Performance (Engineering), Jet engine noise, Halogenated hydrocarbons, Controlled atmospheres, Air

Studies were made of the feasibility of simulating acoustical and aerodynamic characteristics of a full-scale axial flow air compressor with a scale model operating in Freon in a closed loop system. Correlation was attained between model and prototype for both acoustical and aerodynamic performance. Agreement was obtained with a previously published generalized acoustic prediction curve; and an acoustic scaling law was developed which permits rapid prediction of full-scale sound power levels from measurements of the sound power levels produced by a model. (Author)

AD-623 161 See Fld. 13/1

21/8. ROCKET MOTORS AND ENGINES

AD-623 143 Div. 27/3 ,26/1 ,17/4
CFSTI Prices: HC $1.00 MF $0.50
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
RESEARCH AND DEVELOPMENT OF TITANIUM ROCKET MOTOR CASE.
Quarterly rept. no. 18, 1 Apr-30 Jun 65,
by R. J. Makowski, and H. A. Hauser. 31 Jul 65, 25p. Rept. no. PWA-2639
Contract DA19 020ORD5320 Task DA1H02401A111
WAL , 766.2/1-20

Unclassified report

See also AD-428 244.

Descriptors: (*Titanium alloys, Rocket cases), (*Rocket cases, Titanium alloys), Vanadium alloys, Chromium alloys, Aluminum alloys, Fracture (Mechanics), Mechanical working, Tensile properties, Microstructure, Heat treatment, Surface properties, Contamination, Composite materials, Filament wound construction

The results of work performed during the quarter April 1 through June 30, 1965 are reported. Included are discussions of the attempts to flow-turn the last two blanks and an analysis of material from flowturn blank serial number 2 after failure during sizing. (Author)

AD-623 562 Div. 27/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE OPTIMIZATION OF NOZZLE AREA RATIO FOR ROCKETS OPERATING IN A VACUUM,
by M. Goldsmith. 26 Jun 57, 15p. Rept. no. P-1112

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Rocket motor nozzles, Optimization), Rocket propellants, Thrust, Mathematical analysis

The correct choice of nozzle area ratio should be considered in rocket-powered missiles even when intended to operate at high altitudes, where ambient pressure may be neglected. Under such conditions, specific impulse of the propellant increases monotonically with increasing area ratio (exit area/throat area), but the increased weight of larger nozzles degrades performance. Hence an optimum area ratio can be sought which will provide maximum performance for the stage in question. Gains in stage velocity increment due to correct choice of area ratio are usually only a few percent, which may be of importance in some applications. The investigation resulted in a linearized analytic approach to the problem of calculating the optimum area ratio, and design charts are presented. (Author)

21/9. ROCKET PROPELLANTS

AD-623 401 See Fld. 21/2

21/9.1 LIQUID ROCKET PROPELLANTS

AD-623 401 See Fld. 21/2

21/9.2 SOLID ROCKET PROPELLANTS

AD-623 186 See Fld. 21/2

AD-623 251 See Fld. 7/1

AD-623 321 See Fld. 6/15

22. SPACE TECHNOLOGY

AD-623 170 Div. 12/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS
AN ASYMPTOTIC SOLUTION FOR OPTIMUM POWER-LIMITED ORBIT TRANSFER.
Final rept. for 1963-1965,
by Theodore N. Edelbaum. Oct 65, 15p. Rept. no. D-910090-4
Contract AF49 638 1239 Proj. 9749 Task 974901
AFOSR , 65-2002

Unclassified report

Descriptors: (*Transfer trajectories, Numerical analysis), Orbital trajectories, Elliptical orbit trajectories, Partial differential equations, Hamiltonian, Power, Thrust

A complete first-order asymptotic solution was obtained for optimum power-limited transfer be-

tween coplanar elliptic orbits of arbitrary size, eccentricity, and orientation. The solution was obtained by the averaging method of Bogoliubov and Mitropolsky and corresponds to what they call 'the improved first approximation' including both secular and short-period terms. The problem for which the solution is presented corresponds to minimum-fuel transfer in fixed time of a low-thrust rocket operating at constant power and variable thrust. The average acceleration of the rocket is assumed small in relation to the acceleration of gravity. Analytic expressions were derived for the orbit elements, the payoff, and the optimum control. (Author)

AD-623 279 Div. 12/6 ,12/2
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
PERTURBATIONS OF A GRAVITY GRADIENT STABILIZATION SYSTEM,
by R. H. Frick. Sep 65, 69p. Rept. no. RM-4679-ARPA
Contract SD79 Proj. arpa order 189-61
Unclassified report

Descriptors: (*Perturbation theory, Stabilization systems), Gravity, Attitude control systems, Impact shock, Solar radiation

Satellite attitude stabilization systems utilizing the gradient of the earth's gravitational field have the advantage of being completely passive (i.e., no power is required). However, the stabilizing moments developed are extremely small and as a result such systems are subject to attitude perturbations from sources which would ordinarily be neglected in the evaluation of an active stabilization system. This memorandum investigates certain of these sources of attitude perturbation including micro-meteoroid impact, solar radiation pressure, stationkeeping propulsion, orbital eccentricity, and on-board rotating machinery. In the analysis, formulas are developed which determine the magnitude of the pitch, roll and yaw perturbations resulting from each of the above sources. Application of these results to an assumed vehicle configuration shows that the resulting attitude perturbations can be of the order of several degrees. While these perturbations do not necessarily rule out gravity gradient stabilization, their magnitudes for a given vehicle configuration should be considered for their compatibility with the mission requirements. (Author)

AD-623 336 Div. 12/6 ,12/1 ,14/5 ,26/6
CFSTI Prices: HC $3.00 MF $0.75
OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING WASHINGTON D C
PROCEEDINGS OF AEROSPACE SYMPOSIUM ON LUBRICATING TECHNIQUES AND DESIGN STUDIES OF BEARINGS AND GEARS FOR AN ORBITAL MANNED SPACE LABORATORY, HELD 7 MAY 1965.
1965, 63p.
Unclassified report

Sponsored by Department of Defense and American Society of Lubrication Engineers (Aerospace Council).

Descriptors: (*Symposia, Lubrication), (*Lubrication, Manned spacecraft), (*Bearings, Manned spacecraft), (*Gears, Manned spacecraft), (*Manned spacecraft, Lubrication), Design, Laboratories, Lubricants, Seals (Stoppers)

Contents: Fluid lubrication of door activators for manned orbital space station; Fluid seals; Lubricating door activators on a manned orbital space station using only solid lubricants; Use of mechanical transfer systems; Transmitting motion through a vacuum wall.

AD-623 408 Div. 12/6 ,12/2
CFSTI Prices: HC $4.00 MF $1.00
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
CONTROL SYSTEMS THEORY APPLIED TO THE RE-ENTRY OF AEROSPACE VEHICLES I.
Final rept. for Sep 61-Dec 62,
by F. H. Kishi, W. F. Horton, and C. T. Leondes.
Mar 63, 138p. Rept. no. 62-54
Contract AF33 657 7154 Proj. 8225 ,500 Task 82181
ASD , TDR-63-126
Unclassified report

Descriptors: (*Aerospace craft, Atmosphere entry), (*Flight control systems, Atmosphere entry), Reentry vehicles, Attitude control systems, Optimization, Trajectories, Iterative methods, Control theory

In an effort to bridge the gap between theory and practice the re-entry problem area is chosen to apply advanced control techniques. This problem area affords many separate areas where theory could be applied. First of all, Pontryagin's 'Maximum Principle' is applied (short of numerical computation) to formulate the determination of optimal trajectories which minimizes heating and deceleration. Secondly, optimization methods are used as a possible solution to the flight-path control problem. Several alternative procedures are provided. Next, some considerations are given to control loops inside of the flight-path control loop (attitude control problem). Lastly, the re-entry problem provides an area where the so-called 'adaptive control' concepts are applicable. A method is provided where the on-line controller with bounds on the controls can be attacked. Identification procedures are also provided. A bibliography is compiled for the area of re-entry of aerospace vehicles. (Author)

AD-623 450 Div. 12/6 ,12/1 ,2/1
CFSTI Prices: HC $5.00 MF $1.00
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
PROBLEMS IN THE MOTION OF ARTIFICIAL CELESTIAL BODIES.
May 64, 166p. Rept. no. TC-818 Vol. 1
TT , 65-64303
Unclassified report

(Problemy Dvizhenie Iskusstvennykh Nebesnykh Tel) Trans. of Conference on General and Applied Problems of Theoretical Astronomy, Moscow, Vol. 1, p1-164 November 20-25, 1961. Available copy will not permit fully legible reproduction. Reproduction will bee made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Celestial mechanics, Satellites (Artificial)), (*Satellites (Artificial), Celestial mechanics), Perturbation theory, N-body problem, Orbital trajectories, USSR, Symposia

AD-623 452 Div. 12/6 ,12/1 ,2/1
CFSTI Prices: HC $6.00 MF $1.25
AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO LINGUISTIC SECTION
PROBLEMS IN THE MOTION OF ARTIFICIAL CELESTIAL BODIES.
May 64, 202p. Rept. no. TC-818 vol. 2
TT , 65-64304
Unclassified report

(Problemi Dvizheniia Iskusstvennykh Nebesnykh Tel) Trans. of Conference on General and Applied Problems of Theoretical Astronomy, Moscow, V. 2 Nov 20-25 1961 p164-362 Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Celestial mechanics, Satellites (Artificial)), (*Satellites (Artificial), Celestial mechanics), Numerical analysis, Planets, Orbital trajectories, Gravity, USSR, Symposia

AD-623 628 Div. 12/6 ,12/2 ,12/1
CFSTI Prices: HC $5.00 MF $1.25
MASSACHUSETTS INST OF TECH CAMBRIDGE INSTRUMENTATION LAB
CONTROL AND HEAT SHIELD REQUIREMENTS FOR BANK-MODULATED SUPERCIRCULAR ENTRY.
Master's thesis,
by Lawrence T. Brekka. Feb 65, 200p. Rept. no. T-403
Contract AF04 694 553 Proj. DSR 52 226
Unclassified report

Descriptors: (*Atmosphere entry, Manned spacecraft), (*Heat shields, Manned spacecraft), (*Manned spacecraft, Control systems), Reentry vehicles, Lift, Drag, Descent trajectories, Programming (Computers), Pitch (Motion), Yaw, Aeronautics, Astronautics, Conical bodies, Blunt bodies, Delta wings, Gliders

Bank modulation for supercircular entry was investigated from a control and heating standpoint. The use of error rates in feedback for pitch and yaw loops rather than inertial rates was shown to produce reaction-jet impulse savings on the order of 80 percent. Heating was investigated for (1) a pointed half cone trimmed at (L/D) max, (2) a blunted half spherecone trimmed at (L/D) max, (3) a blunted half spherecone trimmed at (C)L max-all these with the round side windward - and (4) a delta-winged glider trimmed to give the L/D of configuration (1). These vehicles were considered to have a 12-man payload capacity. The blunted half sphere-cone trimmed at (C)L max required the least heat protection weight. (Author)

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-
METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM,
AND DYSPROSIUM CONTENTS OF
TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL
INTERPRETATION OF TERRESTRIAL
RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parenthesis directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

*AEROJET- GENERAL CORP AZUSA
CALIF
* * *
TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C
* * *
65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

AD-FIELD INDEX

The AD-Field Index is arranged numerically by AD number and lists the field/group where the full entry can be located in TAB.

SUBJECT INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

•ABNORMAL PSYCHOLOGY
AIR FORCE PERSONNEL
NEUROPSYCHIATRY FOR THE FLIGHT SURGEON.
AD-623 947 FLD.5/10

•ABSORPTION SPECTRUM
AIR
ABSORPTION COEFFICIENTS OF HEATED AIR: A COMPILATION TO 24,000K.
AD-623 370 FLD.20/6

SEMICONDUCTORS
IMPURITY AND EXCITON EFFECTS ON THE INFRARED ABSORPTION EDGES OF III-V COMPOUNDS.
AD-623 668 FLD.20/12

•ABSORPTION(BIOLOGICAL)
CHOLERA
REPRINT: WATER AND ELECTROLYTE ABSORPTION BY THE INTESTINE IN CHOLERA.
AD-623 699 FLD.6/16

•ABSTRACTING
AIR FORCE RESEARCH
SELECTED RAND ABSTRACTS , VOLUME 3, ABSTRACTS 1808-2274, JANUARY-SEPTEMBER 1965.
AD-623 962 FLD.5/1

•ACCIDENTS
PARACHUTE JUMPING
REPRINT: PARACHUTING FOR SPORT.
AD-623 622 FLD.6/16

•ACETYLCHOLINE
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REPRINT: ELECTROPHYSIOLOGICAL INVESTIGATION OF NEUROMUSCULAR TRANSMISSION IN MYASTHENIA GRAVIS.
AD-623 377 FLD.6/16

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NUCLEAR EXPLOSIONS
ACOUSTIC PHASED ARRAYS FOR THE DETECTION OF NUCLEAR BURSTS IN THE ATMOSPHERE.
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TRANSLATION OF RUSSIAN RESEARCH: CONCERNING THE THEORY OF MEASURING RAINDROP SIZE BY THE ACOUSTICAL METHOD.
AD-623 191 FLD.14/2

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SERVOMECHANISMS
EVALUATION OF A MECHANICAL SERVOACTUATOR FOR FLIGHT CONTROL SYSTEMS.
AD-623 111 FLD.1/4

•ADRENOCORTICOTROPIC HORMONE
SECRETION
REPRINT: COMPARISON OF EFFECT OF ENVIRONMENTAL AND PREOPTIC COOLING ON PLASMA CORTISOL LEVELS.
AD-623 293 FLD.6/16

•ADSORPTION
ELECTROCHEMISTRY
ELECTROCHEMISTRY: ELECTROSORPTION ON SOLID ELECTRODES; ELECTROCHEMICAL OXIDATION OF HYDROCARBONS.
AD-623 590 FLD.7/4

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TOWED BODIES
OPERATIONAL TEST AND EVALUATION OF THE TDU-20/B FOAM AERIAL GUNNERY TARGET.
AD-623 309 FLD.19/5

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ATMOSPHERE ENTRY
CONTROL SYSTEMS THEORY APPLIED TO THE RE-ENTRY OF AEROSPACE VEHICLES.
AD-623 908 FLD.22

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EGRESS FROM A SINGLE PLACE CREW STATION IN A WEIGHTLESS ENVIRONMENT.
AD-623 120 FLD.1/3

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AD-623 370 FLD.20/6

•AIR FORCE RESEARCH
ABSTRACTING
SELECTED RAND ABSTRACTS , VOLUME 3, ABSTRACTS 1808-2274, JANUARY-SEPTEMBER 1965.
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AD-623 663 FLD.4/2

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REPRINT: AIR-ION-ENHANCED IRON CHLOROSIS IN BARLEY (HORDEUM VULGARIS) SEEDLINGS.
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PROCEEDINGS OF THE FLUID AMPLIFICATION SYMPOSIUM, 26, 27, AND 28 OCTOBER 1965.
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VISCOSITY
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GAME THEORY
COMPUTER-AIDED INFORMATION SYSTEMS FOR GAMING.
AD-623 091 FLD.15/7

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DIET
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION.
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FIELD THEORY
COSMOLOGY IN TERMS OF OBSERVABLES.
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AD-623 669 FLD.3/1
RESEARCH INTO METHODS OF DETERMINING THE RELATIVE HEIGHTS OF PHYSIOGRAPHIC FEATURES OF THE MOON.
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AD-623 939 FLD.3/1

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TRANSLATION OF RUSSIAN RESEARCH: MATHEMATICS, MECHANICS, AND ASTRONOMY.
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REPRINT: ON THE EXISTENCE OF THE ATLANTIC OCEAN SEAMOUNT KNOWN AS 'AMERICAN SCOUT.'

AD-623 473 FLD.8/10

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(ML TR-65-131)
AD-623 088 FLD.7/3

•AF33 615 1490
GENERAL ELECTRIC RESEARCH LAB SCHENECTADY N Y METALLURGY AND CERAMICS RESEARCH DEPT
65 GC 0316M
(ML TR-65-253)
F AD-623 930 FLD.20/3

•AF33 615 1627
ROCKETDYNE CANOGA PARK CALIF RESEARCH DEPT
R 6260
(ML TR-65-283)
AD-623 644 FLD.11/7

•AF33 615 1749
LINDE DIV UNION CARBIDE CORP INDIANAPOLIS IND
(FDL TR-65-87)
F AD-623 387 FLD.14/2

•AF33 615 1804
INTERNATIONAL BIO-RESEARCH INC ST LOUIS MO
(AMRL TR-65-139)
F AD-623 321 FLD.6/15

•AF33 615 2123
TEXAS UNIV AUSTIN LAB OF MILLIMETER WAVE PROPAGATION

AND ASTRONOMY
AD-623 981 FLD.9/5

•AF33 697 11103 GRANT
PENNSYLVANIA UNIV PHILADELPHIA
DEPT OF PHYSIOLOGY
(AFOSR 65-1511)
AD-623 293 FLD.6/16

•AF33 697 11737
PURDUE UNIV LAFAYETTE IND
DEPT OF STATISTICS
MIMEOGRAPH SERIES NO. 98
AD-623 217 FLD.12/1

•AF33 697 7159
CALIFORNIA UNIV LOS ANGELES
DEPT OF ENGINEERING
62 54
F AD-623 908 FLD.22

•AF33 697 7326
NORAIR DIV NORTHROP CORP
HAWTHORNE CALIF
NOR 65 92
F AD-623 909 FLD.12/1

•AF33 697 7660
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF NUTRITION
AND FOOD SCIENCE
(AMRL TR-64-121)
F AD-623 615 FLD.6/16

•AF33 697 8976
BELL AND HOWELL RESEARCH CENTER
PASADENA CALIF
(ARL 65-130)
AD-623 169 FLD.7/2

•AF33 697 9810
SYSTEMS RESEARCH LABS INC
DAYTON OHIO
(AMRL TDR-64-64)
F AD-623 126 FLD.6/16

•AF91 609 1609
PURDUE UNIV LAFAYETTE IND
AD-623 929 FLD.9/9

•AF91 609 1693
USAF RADIATION LAB UNIV OF
CHICAGO ILL
AD-623 999 FLD.6/16

•AF99 638 1216
SERENDIPITY ASSOCIATES LOS
ANGELES CALIF
(AFOSR 65-1983)
AD-623 294 FLD.9/10

•AF99 638 1239
UNITED AIRCRAFT CORP EAST
HARTFORD CONN RESEARCH LABS
D 910090 9
(AFOSR 65-2002)
F AD-623 170 FLD.22

•AF99 638 1253
STANFORD UNIV CALIF INST
FOR MATHEMATICAL STUDIES
IN THE SOCIAL SCIENCES
TR 79
(AFOSR 65-1594)
AD-623 171 FLD.9/10

•AF99 638 1349
BUREAU OF SOCIAL SCIENCE RESEARCH
INC WASHINGTON D C
(AFOSR 65-1209)
AD-623 172 FLD.5/11

•AF99 638 1491 GRANT
DELAWARE UNIV NEWARK CENTER
FOR RESEARCH ON SOCIAL BEHAVIOR
(AFOSR 65-1989)
AD-623 290 FLD.5/10

•AF99 638 1499
STD RESEARCH CORP PASADENA
CALIF
(AFOSR 65-1416)
AD-623 218 FLD.20/3

•AF99 638 1496
P E C RESEARCH ASSOCIATES
INC-BOULDER COLO
(AFOSR 65-1412)
F AD-623 127 FLD.14/2

•AF99 638 1505
REACTION MOTORS DIV THIOKOL
CHEMICAL CORP DENVILLE
N J
(AFOSR 65-0590)
AD-623 186 FLD.21/2

•AF99 638 496
JOHNS HOPKINS UNIV BALTIMORE
MD DEPT OF MECHANICS
(AFOSR 65-0975)
AD-623 326 FLD.20/4

•AF99 638 696
CALIFORNIA INST OF TECH PASADENA
DIV OF CHEMISTRY AND CHEMICAL
ENGINEERING
(AFOSR TR-60-122)
F AD-623 089 FLD.7/3

•AF99 638 70
MICHIGAN STATE UNIV EAST
LANSING DEPT OF PHYSICS
(AFOSR 65-1596)
F AD-623 337 FLD.20/12

•AF99 638 700
RAND CORP SANTA MONICA CALIF
RM 4445 PR
AD-623 274 FLD.12/1
RM 4503 PR
AD-623 275 FLD.5/1
RM 4652 PR
AD-623 276 FLD.5/1
RM4643 PR
AD-623 277 FLD.17/9
RM 4589 PR
AD-623 283 FLD.15/5
RM 3518 1 PR
AD-623 592 FLD.5/3
RM 4638 PR
AD-623 607 FLD.20/4

•AF99 638 817
ROCKETDYNE CANOGA PARK CALIF
RR 64 29
(AFOSR 65-1319)
AD-623 901 FLD.21/2

•AF61 052 103
CENTRE D'ETUDES DE PHYSIOLOGIE
NERVEUSE ET D'ELECTROPHYSIOLOGIE
PARIS (FRANCE)•
(AFOSR TN-60-1310)
AD-623 266 FLD.6/16
(AFOSR TN-60-1311)
AD-623 267 FLD.6/16
(AFOSR TN-60-1312)
AD-623 268 FLD.6/16
(AFOSR TN-60-1313)
AD-623 269 FLD.6/16
(AFOSR TN-60-1449)
AD-623 270 FLD.6/16
(AFOSR TN-60-1494)
AD-623 271 FLD.6/16

•AF61 052 481
CHALMERS UNIV OF TECHNOLOGY
GOTEBORG (SWEDEN) RESEARCH
LAB OF ELECTRONICS
RR 59
(AFCRL 65-689)
AD-623 697 FLD.20/14

•AF61 052 488
MUNICH UNIV (WEST GERMANY)
METEOROLOGISCHES INSTITUT
F AD-623 906 FLD.4/2

•AF61 052 524
MANCHESTER UNIV (ENGLAND)
DEPT OF ASTRONOMY
(AFCRL 65-431)
F AD-623 669 FLD.5/1
(AFCRL 65-431A)
F AD-623 684 FLD.5/1

•AF61 052 691
TECHNISCHE HOCHSCHULE DARMSTADT
(GERMANY)
(AFCRL 65-774)
F AD-623 569 FLD.20/4

•AF61 052 690
UNIVERSITY COLL OF WALES
ABERYSTWYTH DEPT OF APPLIED
MATHEMATICS
(AFCRL 65-775)
F AD-623 667 FLD.4/2

•AF61 052 762
ROYAL INST OF TECH STOCKHOLM
(SWEDEN) DEPT OF PHYSICS
SR 3
(AFCRL 65-776)
AD-623 664 FLD.7/4

•AF61 052 807
ROME UNIV (ITALY) ISTITUTO
DI ELETTRONICA
(AFCRL 65-781)
AD-623 670 FLD.20/14

•AF61 052 814
CENTRE DE PHYSIQUE ELECTRONIQUE
ET CORPUSCULAIRE ORSAY
(FRANCE)
NR 1421
AD-623 984 FLD.9/1

•AF61 514 6306
ATELIERS DE CONSTRUCTIONS
ELECTRIQUES DE CHARLEROI
(FRANCE)
AD-623 224 FLD.20/3

•AT49 2905 4
NAVAL RADIOLOGICAL DEFENSE
LAB SAN FRANCISCO CALIF
USNRDL TR 899
AD-623 985 FLD.20/8

•AT49 5 2084
NAVAL RADIOLOGICAL DEFENSE
LAB SAN FRANCISCO CALIF
USNRDL TR 912
AD-623 388 FLD.7/2

•AT49 5 2110
NAVAL RESEARCH LAB WASHINGTON
D C
NRL 6317
F AD-623 966 FLD.11/6

•DA ARO D31 124 61624
SYRACUSE UNIV N Y DEPT OF
MECHANICAL ENGINEERING
65 WA/APM 27
(AROD 2965:11)
AD-623 999 FLD.20/12

•DA ARO D31 1246146
PURDUE UNIV LAFAYETTE IND
DEPT OF CHEMISTRY
(3047:10)
F AD-623 289 FLD.7/3

•DA ARO D31 1246158
ILLINOIS UNIV URBANA DEPT
OF MINING METALLURGICAL
AND PETROLEUM ENGINEERING
(AROD 3306:6)
F AD-623 221 FLD.11/6

•DA ARO D31 1246206
CALIFORNIA UNIV LOS ANGELES
(AROD 3632:12)
F AD-623 479 FLD.7/3

•DA ARO D31 1246484
BROWN UNIV PROVIDENCE R I
(AROD 1271:49)
AD-623 964 FLD.20/3

•DA ARO D31 1246897
ILLINOIS INST OF TECH CHICAGO

DEPT OF METALLURGICAL ENGINEERING
TR 1
(AROD 5030:1)
AD-623 594 FLD.11/6

•DA ARO D31 1246639
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
(AROD 5427:2)
AD-623 919 FLD.9/1

•DA AR049 092 64G40
INSTITUTO DE NEUROLOGIA MONTEVIDEO (URUGUAY)
F AD-623 631 FLD.6/15

•DA AR049 092 69G61
SAO PAULO UNIV (BRAZIL)
INSTITUTO DE MEDICINA TROPICAL
AD-623 610 FLD.6/16

•DA19 0200RD5320
PRATT AND WHITNEY AIRCRAFT
EAST HARTFORD CONN
PWA 2639
AD-623 143 FLD.21/8

•DA22 079ENG393
STRUCTURAL MECHANICS RESEARCH LAB UNIV OF TEXAS AUSTIN
AD-623 317 FLD.11/9
AD-623 327 FLD.20/12

•DA28 043AMC00032E
ILLINOIS STATE WATER SURVEY
URBANA METEOROLOGIC LAB
AD-623 409 FLD.4/2

•DA28 043AMC00073E
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
AD-623 404 FLD.20/3
R 268
AD-623 526 FLD.5/9

•DA28 043AMC00073E GRANT
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R 267
AD-623 525 FLD.9/4

•DA28 043AMC00164E
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
IITRI A6093 9
AD-623 204 FLD.17/2

•DA28 043AMC00284E
ELECTRONIC FILMS INC BURLINGTON MASS
AD-623 314 FLD.9/1

•DA28 043AMC00299E
BROWN UNIV PROVIDENCE R I
AD-623 174 FLD.20/12

•DA28 043AMC00314E
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
AD-623 403 FLD.9/1

•DA28 043AMC00439E
TEXAS INSTRUMENTS INC DALLAS APPARATUS DIV
U1 60990 1
F AD-623 417 FLD.9/1

•DA28 043AMC01287E
ILLINOIS STATE WATER SURVEY
URBANA ATMOSPHERIC SCIENCES SECTION
AD-623 468 FLD.4/2

•DA28 043AMC01293E
ARACON GEOPHYSICS CO CONCORD MASS
(ECOM 01273-1)
AD-623 532 FLD.4/2

•DA28 043AMC01291(E)
PENNSYLVANIA UNIV PHILADELPHIA
ELECTRO-CHEMISTRY LAB
AD-623 660 FLD.10

•DA28 043AMC01320E
MARTIN CO ORLANDO FLA
OR 6686
AD-623 470 FLD.9/1

•DA30 069AMC5394A
INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y
AD-623 391 FLD.20/6
AD-623 392 FLD.20/6

•DA30 069ORD3743
TITANIUM METALS CORP OF AMERICA NEW YORK
(WAL TR-409/2-9)
AD-623 600 FLD.11/6

•DA31 124ARO D GRANT
DELAWARE UNIV NEWARK DEPT OF PHYSICS
(AROD 4461:4)
AD-623 363 FLD.20/12

•DA31 124ARO D136
LAMONT GEOLOGICAL OBSERVATORY
PALISADES N Y
(AROD 4120:2)
F AD-623 592 FLD.8/11

•DA31 124ARO D17
PURDUE UNIV LAFAYETTE IND
DEPT OF PHYSICS
AD-623 397 FLD.20/12

•DA31 124ARO D331
OPERATIONS RESEARCH CENTER
UNIV OF CALIF BERKELEY
ORC 65 18
(AROD 5307:4)
AD-623 310 FLD.12/1
ORC 65 27
(AROD 5307.5)
AD-623 465 FLD.12/1

•DA31 124ARO D385 GRANT
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
ERL M 122
(AROD 5537:2)
AD-623 593 FLD.9/1

•DA31 124ARO D88
MINNESOTA UNIV ST PAUL DEPT OF BIOCHEMISTRY
(AROD 4145:2)
F AD-623 473 FLD.7/4

•DA31 124ARO D97
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA
PHILADELPHIA
(AROD 3653:4M)
AD-623 333 FLD.12/1

•DA31 124AROD G218
PENNSYLVANIA UNIV PHILADELPHIA
DEPT OF MATHEMATICS
AD-623 536 FLD.12/1

•DA31 124AROD211 GRANT
PURDUE UNIV LAFAYETTE IND
DEPT OF CHEMISTRY
(3047:10)
F AD-623 285 FLD.7/3

•DA36 039AMC01473E
API INSTRUMENTS CO CHESTERLAND OHIO
AD-623 311 FLD.14/2

•DA36 039AMC01478E
CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO NORWOOD MASS
AD-623 395 FLD.9/1

•DA36 039AMC02284E
GENERAL TELEPHONE AND ELECTRONICS LABS INC BAYSIDE N Y
TR 65 103.9
AD-623 324 FLD.9/1

•DA36 039AMC03200E GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
STR 12
AD-623 319 FLD.6/3

•DA36 039AMC03247E
STANFORD RESEARCH INST MENLO PARK CALIF
AD-623 280 FLD.9/2

•DA36 039AMC03283E
WATKINS-JOHNSON CO PALO ALTO CALIF
F AD-623 609 FLD.9/1

•DA36 039AMC03411E
NEW YORK UNIV N Y GEOPHYSICAL SCIENCES LAB
65 6
F AD-623 513 FLD.4/2
65 7
F AD-623 478 FLD.4/2

•DA36 039AMC03621E
SPRAGUE ELECTRIC CO NORTH ADAMS MASS
AD-623 107 FLD.9/1

•DA36 039AMC03703E
ILLINOIS UNIV URBANA ELECTRICAL ENGINEERING RESEARCH LAB
AD-623 289 FLD.4/2

•DA36 039AMC03742E
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
HSER 3111
AD-623 284 FLD.9/1

•DA36 039AMC06161E
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
AD-623 265 FLD.9/1

•DA36 039AMC06166E
GENERAL ELECTRIC CO LYNCHBURG VA COMMUNICATION PRODUCTS DEPT
AD-623 320 FLD.9/1

•DA36 039SC89964
BURNDY CORP NORWALK CONN
AD-623 176 FLD.9/3

•DA36 039SC89098
UNION CARBIDE CORP CLEVELAND OHIO ELECTROCHEMICAL PRODUCT DEVELOPMENT LAB
F AD-623 329 FLD.10/3

•DA36 039SC89202
TEXAS A AND M UNIV COLLEGE STATION DEPT OF METEOROLOGY
REF 65 31T
AD-623 175 FLD.4/2

•DA36 039SC90753
MARTIN CO ORLANDO FLA
OR 6653
F AD-623 463 FLD.20/6

•DA44 009AMC469T
PENNSYLVANIA UNIV PHILADELPHIA ELECTRO-CHEMISTRY LAB
AD-623 550 FLD.7/4

•DA44 009AMC897T
AMERICAN CYANAMID CO STAMFORD CONN RESEARCH LABS
AD-623 549 FLD.10

•DA44 009AMC930T
HOLMAN (JOHN F) CO INC WASHINGTON D C
T 1807 65
(TT 65-64498)
AD-623 633 FLD.7/2

T 1808 65
(TT 65-64499)
AD-623 634 FLD.20/6
T 1809 65
(TT 65-64500)
AD-623 635 FLD.7/2

•DA99 177AMC129T
BOEING CO MORTON PA VERTOL DIV
R 920
(USAAVLABS TR-65-63)
F AD-623 129 FLD.1/3

•DA99 177AMC169T
OKLAHOMA UNIV RESEARCH INST NORMAN
(USAAVLABS TR-65-60)
F AD-623 128 FLD.11/7

•DA99 177AMC169T
VTOL SYSTEMS DIV CURTISS-WRIGHT CORP CALDWELL N J
(USAAVLABS TR-65-69)
F AD-623 527 FLD.1/3

•DA99 177AMC208T
HARMCO RESEARCH AND DEVELOPMENT DIV WHITTAKER CORP SAN DIEGO CALIF
(USAAVLABS TR-65-58)
F AD-623 130 FLD.11/7

•DA99 177AMC232T
LOCKHEED-CALIFORNIA CO BURBANK
LR 18636
(USAAVLABS TR-65-62)
AD-623 111 FLD.1/9

•DA99 177AMC240T
SIKORSKY AIRCRAFT DIV UNITED AIRCRAFT CORP STRATFORD CONN
50401
(USAAVLABS TR-65-40)
F AD-623 531 FLD.1/3

•DA99 188 ARO2
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
TR 65 9
AD-623 396 FLD.17/7

•DA99 188ARO1
RESEARCH ANALYSIS CORP MCLEAN VA
RAC TP 187
AD-623 097 FLD.12/1

•DA99 186AMC183D
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
TR 400 118
A AD-623 206 FLD.9/5

•DA99 193MD2627
DELAWARE UNIV NEWARK
AD-623 398 FLD.6/3

•DRB9390 14
TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
AD-623 219 FLD.6/16

•FA WA9583
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
(FAA-ADS 24)
AD-623 978 FLD.1/2

•FAA BRD903
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
AIL 1400 3
F AD-623 102 FLD.1/5
AIL 1400 4
F AD-623 134 FLD.1/5

•FAWA9903
BOLLAY (E) ASSOCIATES INC GOLETA CALIF
(SRDS RD-65-15)
F AD-623 306 FLD.1/2

•FA64WA9034
GENERAL ELECTRIC CO CINCINNATI OHIO APPLIED RESEARCH AND AERODYNAMICS DESIGN OPERATION
(FAA-ADS 47)
AD-623 491 FLD.21/5

•NBY29967
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
TR 2
AD-623 595 FLD.20/12

•NBY93191
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA RESEARCH AND DEVELOPMENT CENTER
WG 82137
F AD-623 900 FLD.13/10

•NIH A1236C6
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
(AFOSR 65-1910)
AD-623 496 FLD.6/16

•NIH HE01999
EDSEL B FORD INST FOR MEDICAL RESEARCH DETROIT MICH
AD-623 629 FLD.6/1

•NIH HD3709
NORTHWESTERN UNIV CHICAGO ILL DEPT OF MICROBIOLOGY
AD-623 909 FLD.6/13

•NIH NB03184
CALIFORNIA UNIV BERKELEY NEUROSENSORY LAB
AD-623 343 FLD.6/16

•NIH NB03712 03
UPPSALA UNIV (SWEDEN) INST OF PHYSIOLOGY
(AFOSR 65-1592)
AD-623 372 FLD.6/16

•NOBSR89201
LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV
GRR 65 1109
AD-623 997 FLD.14/2

•NOBSR89229
RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
TR 15
AD-623 334 FLD.9/2
TN 3
AD-623 357 FLD.9/5

•NOBSR89334
GENERAL ELECTRIC CO OKLAHOMA CITY OKLA MILITARY COMMUNICATIONS DEPT
AD-623 260 FLD.17/2

•NOBSR89408
EDGERTON GERMESHAUSEN AND GRIER INC BEDFORD MASS SYSTEMS DIV
B 3193
AD-623 636 FLD.9/1

•NOBSR93320
RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS
AD-623 138 FLD.9/1

•NOBSR93369
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
AD-623 910 FLD.9/1

•NOBS72444
ARMOUR RESEARCH FOUNDATION CHICAGO ILL
AD-623 197 FLD.9/1

•NOBS77017
STANFORD RESEARCH INST MENLO PARK CALIF
AD-623 970 FLD.10

•NOBS78226
TITANIUM ALLOY MFG DIV NATIONAL LEAD CO NIAGARA FALLS N Y
AD-623 974 FLD.10

•NOBS78656
GENERAL INSTRUMENT CORP NEWARK N J THERMOELECTRIC DIV
F AD-623 977 FLD.10

•NOBS88639
DU PONT DE NEMOURS (E I) AND CO INC WILMINGTON DEL PIGMENTS DEPT
F AD-623 991 FLD.10

•NOBS92280
AMERICAN SOCIETY OF MECHANICAL ENGINEERS NEW YORK
AD-623 996 FLD.11/6

•NONR G00049 62
STEWARD OBSERVATORY UNIV OF ARIZONA TUCSON
F AD-623 972 FLD.9/1

•NONR G00061 65
TULANE UNIV NEW ORLEANS LA
MIMEOGRAPH SERIES 1
F AD-623 366 FLD.12/1

•NONR G03600
DELAWARE UNIV NEWARK DEPT OF PHYSICS
(AROD 4961-4)
AD-623 363 FLD.20/12

•NONR 40159
CORNELL UNIV ITHACA N Y DEPT OF INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH
TR 2
AD-623 519 FLD.9/1

•NONR600039 64
WASHINGTON UNIV SEATTLE DEPT OF PREVENTIVE MEDICINE
(NAVMED MR005.09-1201.9.8)
AD-623 693 FLD.6/16

•NONR1100 26
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
MIMEOGRAPH SERIES NO. 98
AD-623 217 FLD.12/1
MIMEOGRAPH SERIES NO. 97
AD-623 216 FLD.12/1

•NONR114713
COLORADO UNIV BOULDER
AD-623 914 FLD.9/1

•NONR120214
WISCONSIN UNIV MADISON DEPT OF ZOOLOGY
AD-623 178 FLD.6/3

•NONR120217
WISCONSIN UNIV MADISON DEPT OF STATISTICS
TR 38
AD-623 696 FLD.12/1
TR 37
AD-623 697 FLD.12/1
TR 40
AD-623 698 FLD.12/1
TR 41
AD-623 699 FLD.12/1

•NONR122439
MICHIGAN UNIV ANN ARBOR CELLULAR BIOCHEMISTRY LAB
AD-623 938 FLD.6/16

•NONR122447
MICHIGAN UNIV ANN ARBOR
DEPT OF CHEMICAL AND METALLU
RGICAL ENGINEERING
05612 2 T
AD-623 928 FLD.20/12

•NONR122817
NORTHWESTERN UNIV EVANSTON
ILL DEPT OF MATERIALS SCIENCE
TR 8
AD-623 313 FLD.7/4

•NONR165600 GRANT
EDSEL B FORD INST FOR MEDICAL
RESEARCH DETROIT MICH
AD-623 629 FLD.6/1

•NONR183402
RADIOLOCATION RESEARCH LAB
UNIV OF ILLINOIS URBANA
RRL 288
AD-623 580 FLD.20/14
TR 27
AD-623 177 FLD.17/7

•NONR183415
ILLINOIS UNIV URBANA DEPT
OF COMPUTER SCIENCE
187
AD-623 261 FLD.9/2
188
AD-623 555 FLD.9/2

•NONR183427
ILLINOIS UNIV URBANA DEPT
OF COMPUTER SCIENCE
186
AD-623 398 FLD.20/13

•NONR183436
ILLINOIS UNIV URBANA GROUP
EFFECTIVENESS RESEARCH LAB
TR 24
AD-623 312 FLD.5/10

•NONR183439
ILLINOIS UNIV URBANA DEPT
OF PSYCHOLOGY
AD-623 173 FLD.5/10

•NONR185815 GRANT
PRINCETON UNIV N J
RM 65 11
AD-623 205 FLD.9/2
RB 65 33
AD-623 342 FLD.5/10

•NONR185839
HIGH ENERGY PHYSICS LAB STANFORD
UNIV CALIF
HEPL 405
AD-623 658 FLD.20/8

•NONR186610
HARVARD UNIV CAMBRIDGE MASS
DIV OF ENGINEERING AND APPLIED
PHYSICS
PR 35
AD-623 144 FLD.20/12

•NONR186616
CRUFT LAB HARVARD UNIV CAMBRIDGE
MASS
SR 5 (SERIES 3)
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623 457	20/4
623 458	20/3
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623 460	20/4
623 461	4/2
623 462	5/1
623 463	20/6
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623 465	12/1
623 466	13/13
623 467	7/4
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623 472	3/1
623 473	8/10
623 474	7/3
623 475	7/4
623 477	6/13
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623 481	6/15
623 482	4/2
623 483	4/2
623 484	11/8
623 485	20/8
623 486	6/16
623 487	9/2
623 488	20/3
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623 519	5/1
623 520	20/6
623 521	20/6
623 522	20/6
623 523	20/6
623 524	20/6
623 525	9/4
623 526	5/9
623 527	1/3
623 528	20/12
623 529	5/9
623 530	20/3
623 531	1/3
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623 534	5/10
623 535	6/16
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623 562	21/8
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623 586	9/1
623 587	17/8
623 588	13/8
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623 602	20/12
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623 630	5/1
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623 633	7/2
623 634	20/6
623 635	7/2
623 636	9/1
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623 639	14/2
623 640	18/8
623 641	6/16
623 642	12/1
623 643	17/9

623 644	11/7
623 645	17/2.1
623 646	20/14
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623 648	20/14
623 649	20/12
623 650	19/4
623 651	5/1
623 652	5/10
623 653	18/8
623 654	8/14
623 655	20/14
623 656	9/5
623 657	20/14
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623 660	10
623 661	8/2
623 662	4/2

623 663	4/2
623 664	7/4
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623 666	12/1
623 667	4/2
623 668	20/12
623 669	3/1
623 670	20/14
623 671	6/16
623 672	5/3
623 673	3/1
623 674	5/10
623 675	12/1
623 676	6/16
623 678	6/12
623 679	17/1
623 680	11/8
623 681	8/14
623 682	4/2

623 683	5/10
623 684	3/1
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623 692	6/16
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623 698	12/1
623 699	12/1
623 700	6/16

OTHER RESEARCH REPORTS AND RELATED MATERIAL

CIVILIAN AGENCY REPORTS, INCLUDING AEC AND NASA, AND MILITARY REPORTS PREVIOUSLY CLASSIFIED OR LIMITED

*Descriptors marked with an asterisk are included in the subject index

01. Aeronautics

AD-450 800 Field 1A
CFSTI Price: HC$2.00

Defense Research Lab., Univ. of Texas, Austin.
DETACHED SHOCK FRONTS, EXTENSION OF ATTACHED CURVED SHOCK FRONT ANALYTICAL METHODS.
Technical rept.,
by P. H. Miller. 11 Feb 64, 41p
Rept. nos. DRL-512; CR-8
Contract NORd16498, Task UTX 2A
N64 33700

Unclassified report

Descriptors: (*Shock waves, Aerodynamic characteristics), (*Nose cones, Fluid dynamic properties), Angle of attack, Boundary layer, Blunt bodies, Mathematical analysis.

The analytical expression which was previously derived to describe the shape and position of attached curved shock fronts has been extended, by means of a slight modification of the coordinate system origin, to the cases of detached curved shock fronts. Theoretical and experimental results were compared and the agreement was shown to be excellent. Suggestions have been included for possible techniques which would make the method more directly applicable for the designer. (Author)

AD-452 725 Field 1A
CFSTI Prices: HC$2.00

Redstone Scientific Information Center, Redstone Arsenal, Ala.
AERODYNAMIC CHARACTERISTICS OF RING WINGS; A BIBLIOGRAPHY,
by John E. Terry. Sep 64, 32p
Rept. no. RSIC-285

Unclassified report

Descriptors: (*Ring wings, Aerodynamic characteristics), Bibliographies, Control surfaces, Lift, Drag, Subsonic flow, Supersonic flow, Vortices, Turbulent boundary layer, Flutter, Incompressible flow, Airfoils, Pressure, Fuselages.

The cited references pertain primarily to the following aerodynamic information on ring wings, also known as annular wings or circular wings: calculation of circumferential velocity and pressure distribution, studies on flow separation phenomena at the wing leading and trailing edges, measurement of lift, drag and pitching moment, application of linearized theory to subsonic and supersonic gas flow, theory and measurement of vortex drag, measurement of three-dimensional turbulent boundary layer, determination of flutter using linearized equations, theory of stationary, inviscid, incompressible flow around the wing, studies on drag reduction, studies on interference effects of an axisymmetric fuselage or a strut on wing pressure distributions, wind tunnel tests of wings with and without a fuselage, and determination of optimum shape. (Author)

N65-21461 Field 1A
CFSTI Prices: HC$3.00 MF$0.75

Brown Engineering Co., Inc., Huntsville, Ala. Research Labs.
ANALYSIS OF FLOW FROM PLUG NOZZLES WITH SECONDARY EJECTOR SYSTEMS,
by C. G. Lee and S. J. Inman. Jan 65, 85p
R-128
Contract NAS8 5289
NASA CR-62188

Unclassified report

Descriptors: (*Nozzle gas flow, Jet pumps).

N65-27946 Field 1B
CFSTI Prices: HC$4.00 MF$1.00

Systems Technology, Inc., Hawthorne, Calif.
DEVELOPMENT OF SATISFACTORY LATERAL-DIRECTIONAL HANDLING QUALITIES IN THE LANDING APPROACH,
by Robert L. Stapleford, DonaldE. Johnston, Gary L. Teper, and David H. Weir. Jul 65, 109p
Contract NAS2 864
NASA CR-239

Unclassified report

Descriptors: (*Landings, Control systems).

N65-28448 Field 1A, 22A, 16D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
HEAR-TRANSFER MEASUREMENTS ON A BLUNT SPHERICAL-SEGMENT NOSE TO A MACH NUMBER OF 15.1 AND FLIGHT PERFORMANCE OF THE ROCKET-PROPELLED MODEL TO A MACH NUMBER OF 17.8,
by Charles B. Rumsey and Dorothy B. Lee.
Nov 59, 48p Rept. no. TMX-77

Unclassified report

Descriptors: (*Heat transfer, Aerodynamic heating), (*Spacecraft, Model tests).

N65-29295 Field 1A, 9B
CFSTI Prices: HC$4.00 MF$1.00

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
COMPUTER PROGRAM FOR CALCULATING FLOW FIELDS IN SUPERSONIC INLETS,
by Virginia L. Sorensen. Jul 65, 131p
NASA-TN-D-2897

Unclassified report

Descriptors: (*Ducts, Supersonic flow), (*Supersonic flow, Programming(Computers)).

N65-29843 Field 1A
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.

EXPERIMENTAL INVESTIGATION OF A TURBULENT BOUNDARY LAYER AT MACH 6, HIGH REYNOLDS NUMBERS, AND ZERO HEAT TRANSFER,
by Jerry B. Adcock, John B. Peterson, Jr., and Donald I. McRee. Jul 65, 58p NASA-TN-D-2907
Unclassified report

Descriptors: (*Turbulent boundary layer, Hypersonic characteristics), (*Hypersonic characteristics, Turbulent boundary layer).

N65-29965 Field 1A
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
NEWTONIAN AERODYNAMIC CHARACTERISTICS OF RIGHT ELLIPTICAL RAKED-OFF CONES FOR THICKNESS RATIOS OF 2.25 TO 3,
by Robert H. Lamb, Ralph E. Graham, and Paul O. Romere. Aug 65, 68p NASA-TN-D-2947
Unclassified report

Descriptors: (*Conical bodies, Aerodynamic characteristics), (*Aerodynamic characteristics, Conical bodies).

Patent 3,208,692 Field 1C, 21F

TUG-TOW ARRANGEMENT FOR NUCLEAR AIRCRAFT.
Patent assigned to AEC,
by Seymour Bernstein. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Airplanes, Nuclear propulsion), (*Towed planes, Nuclear propulsion), (*Towing planes, Nuclear propulsion), Nuclear particles, Nuclear power plants, Patents.

An operationally-integrated combination of aircraft is disclosed. It includes a tug airplane powered by a radiation-emitting power source, a tow aircraft adapted to carry a crew, a coupling between the airplanes to permit unpowered flight of the tow aircraft and controls in the towed aircraft for controlling the tug airplane. The towed airplane carries its own power source for flight after release from the tug airplane.

Patent 3,208,694 Field 1D, 1B

NOSE GEAR STEERING SYSTEM FOR VEHICLE WITH MAIN SKIDS.
Patent assigned to NASA,
by Upshur T. Joyner. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Aircraft landings, Control systems), (*Nose wheels, Control systems), Landing gear, Taxing, Hydraulic systems, Reentry vehicles, Patents.

The steering system is for aircraft having main gear skids and a swiveling nose gear. A fluid motor is provided into which a fluid is forced under controlled conditions of pressure and direction to create a moment about the nose gear that permits steering and retention of directional stability of an aircraft.

SC-TM-65-93 Field 1D
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
GAS BEARING ATTITUDE CONTROL SIMULATOR,
by D. R. Schafer. Apr 65, 17p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Attitude control systems, Simulators), (*Simulators, Gas bearings).

SU-247-7 Field 1A
CFSTI Prices: HC$3.00 MF$0.75

Stanford Univ., Calif. Dept. of Mechanical Engineering.
TURBULENT HEAT AND MOMENTUM TRANSFER FOR GASES IN A CIRCULAR TUBE AT WALL TO BULK TEMPERATURE RATIOS TO SEVEN,
by H. C. Perkins and P. Worsoe-Schmidt. Sep 64, 92p
Contract AT(04-3)-247
Unclassified report

Descriptors: (*Heat transfer, Gases), (*Transport properties, Momentum).

02. Agriculture

TID-20741 Field 2A, 7C
CFSTI Prices: HC$1.00 MF$0.50

California Univ., Los Angeles.
EFFECTS OF CHELATED IRON AND ZINC ON ROUGH LEMON AND TRIFOLIATE ORANGE SEEDLINGS GROWN IN CALCAREOUS AND NONCALCAREOUS SOIL,
by A. H. Khadr, A. Wallace and E. M. Romney. 1964, 10p
Contract AT(11-1)-34
Unclassified report

Descriptors: (*Plants(Botany), Complex compounds), (*Complex compounds, Plants(Botany)).

03. Astronomy and Astrophysics

MIT-2098-123 Field 3B
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science.
OBSERVATIONAL WORK ON COSMIC GAMMA RAYS,
by George W. Clark. 8 Mar 65, 22p
CONF-641214-1
Contract AT(30-1)-2098; Grant AF AFOSR546 64
Unclassified report

Descriptors: (*Cosmic rays, Gamma rays), (*Astronomical observatories, Cosmic rays).

N65-16480 Field 3B
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Observatory.

THE EFFECT OF LINE BLANKETING ON ULTRAVIOLET STELLAR RADIATION,
by D. C. Morton. 1964, 6p
NSG-414
NASA CR-53422

Unclassified report

Descriptors: (*Stars, Ultraviolet radiation), (*Ultraviolet radiation, Stars).

N65-17872 Field 3B, 3A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
METEOROID SIMULATION USING LASERS,
by O. K. Hudson. 25 Aug 64, 15p
NASA-TM-X-53122

Unclassified report

Descriptors: (*Meteors, Simulation), (*Lasers, Astrophysics).

N65-22177 Field 3A, 3B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SKY TEMPERATURE BEHIND THE MOON,
by C. R. Somerlock. 1964, 7p
NASA TM-X-51716

Unclassified report

Descriptors: (*Moon, Atmospheric temperature), (*Lunar environment, Atmospheric temperature).

N65-23194 Field 3B
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ON THE STABILITY AND STRUCTURE OF SHOCK WAVES IN INTERPLANETARY SPACE,
by F. L. Hinton. Apr 65, 43p Memo no. RM-4490
Contract NASr-21
NASA CR-62521

Unclassified report

Descriptors: (*Shock waves, Plasma physics), (*Space environmental conditions, Shock waves).

N65-24983 Field 3B, 3A
CFSTI Prices: HC$2.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE JOVIAN ENVIRONMENT,
by Lawrence M. Trafton. 8 Mar 62, 26p
JPL-TM-33-77
Contract NAS7 100
NASA CR-63116

Unclassified report

Descriptors: (*Jupiter, Planetary atmospheres), (*Astrophysics, Jupiter).

N65-26075 Field 3B, 3A
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
NOTE ON THERMAL PROPERTIES OF MARS,
by C. Leovy. Apr 65, 23p RM-4551-NASA
Contract NASr 21(07)
NASA CR-63278

Unclassified report

Descriptors: (*Mars, Thermal properties), (*Astrophysics, Mars).

N65-27812 Field 3B
CFSTI Price: HC$3.00

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
EXTRAGALACTIC RADIO SOURCES,
by Wolfgang Priester and Johan Rosenberg. Jul 65, 53p NASA-TN-D-2888

Unclassified report

Descriptors: (*Radio astronomy, Galaxies), (*Astrophysics, Extraterrestrial radio waves).

N65-28849 Field 3A, 3B
CFSTI Prices: HC$1.50 MF$1.00

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
PLANETARY ATMOSPHERES, A CONTINUING BIBLIOGRAPHY.
Rept. for Jan 62-Feb 65.
Jun 65, 144p NASA-SP-7017

Unclassified report

Descriptors: (*Planetary atmospheres, Bibliographies), (*Astronomy, Planetary atmospheres).

N65-29299 Field 3B, 22C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
ANALYSIS OF THE ERRORS ASSOCIATED WITH THE DETERMINATION OF PLANETARY ATMOSPHERE STRUCTURE FROM MEASURED ACCELERATIONS OF AN ENTRY VEHICLE,
by Victor L. Peterson. Jul 65, 21p NASA-TR-R-225

Unclassified report

Descriptors: (*Planetary atmospheres, Mars probes), (*Mars probes, Atmosphere entry).

PB-168 465 Field 3B, 3C
CFSTI Prices: HC$1.00 MF$0.50

Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
BRIGHTNESS CHANGES IN PERIODIC COMETS,
by Fred L. Whipple and Diarmaid H. Douglas-Hamilton. 9 Aug 65, 20p Special rept. SAO-SR-181

Unclassified report

Descriptors: (*Comets, Brightness), (*Astrophysics, Comets), Celestial mechanics, Luminescence, Solar wind, Sunspots, Optics.

Visual brightness estimates of Comets Encke and Faye are corrected for aperture of telescope by a formula due to Opik, and reduced to absolute magnitude (H). A secular decrease in absolute brightness is indicated for both. On the assumption of a linear decrease with time in the diameter and brightness of an icy nucleus, 'death dates' of 1991 - 2000 for Encke and 1978 - 1985 for Faye were found. The possible dependence of absolute

magnitude fluctuations on solar activity is examined by plotting residuals from the magntidue curve against the mean monthly sunspot number for Comet Encke. No correlation is found. The observed occurrence of tail or nucleus for Comet Encke is studied in relation to solar activity. The observations at 45 apparitions are divided into two groups at sunspot number SS = 36, and examined with a four-choice diagram; tail : no tail: SS>36 : SS<36. The sq x test indicates a correlation with greater than 99.9 percent probability. The occurrence of a nucleus is strongly correlated with the presence of a tail (>99.9 percent probability) and less strongly correlated with the sunspot number (>95 percent probability). The obvious physical agent to produce the variable tail and nucleus phenomena is the solar wind. (Author)

PB-168 557 Field 3B
CFSTI Prices: HC$2.00 MF$0.50

Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
ON THE PHYSICS AND SPLITTING OF COMETARY NUCLEI.
Special rept. on Research in Space Science,
by Fred L. Whipple and Robert P. Stefanik.
Jul 65, 28p Rept. no. SAO-SR-182
Unclassified report

Presented at the International Astrophysical Symposium (13th), on the 'Nature and Origin of Comets' at the Institut d'Astrophysique, Universite de Liege, Cointe-Sclessin (Belgium), Jul 5-7 1965.

Descriptors: (*Comets, Thermodynamics), Solar radiation, Heating, Radioactive decay, Sublimation, Ice, Surface temperatures.

The effect of radioactive heating on an icy conglomerate cometary nucleus is considered. The heat conductivity in such a body is extremely low and the surface temperatures required to radiate the heat generated for reasonable cometary dimensions are also very low, less than 10K. Heat and mass transfer is effected in the early stages primarily by the sublimation in the core of the more volatile materials, such as CH4, which diffuse outward and recondense near the surface of the nucleus. After ejection into the cometary cloud the outer shell of the more volatile materials develops and thickens, leaving the comet with an external brittle shell and a core depleted of the more volatile constituents. During its long stay in 'interstellar' space the comet is affected by practically no external physical forces. On its first close approach to the sun, however, it is for the first time exposed to strong external solar radiation and sublimation. This is a form of heat shock which may cause comets to split. (Author)

UCRL-7820 Field 3B, 20M
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
CALCULATION OF STELLAR STRUCTURE USING AN IONIZATION EQUILIBRIUM EQUATION OF STATE,
by Carl A. Rouse. 20 Jul 64, 41p Unclassified report
Contract W-7405-eng-48

Descriptors: (*Stars, Equations of State), (*Equations of state, Ionization).

04. Atmospheric Sciences

AD-463 716 Field 4B, 17B
CFSTI Price: HC$3.00

Research Labs. Div., Bendix Corp., Southfield, Mich.
DEVELOPMENT OF AN ATMOSPHERIC SOUNDING DROPSONDE, GROUND RECEIVING AND DATA PROCESSING STATION.
Final summary rept.,
by R. A. Mullen and J. E. Lynott. Feb 65, 74p
Rept. no. RLD-2537
Contract AF33 600 41821
Unclassified report

Rept. on Vertical Sensor Techniques Program.

Descriptors: (*Atmospheric sounding, Instrumentation), (*Meteorological instruments, Atmospheric sounding), Radiosondes, Telemeter systems, Data processing systems, Meteorological parameters.

The design and testing of the balloon-lifted dropsonde field test vehicle used in the flight demonstration of sensor feasibility is described, along with the mobile field telemetry station associated with the dropsonde in the field test. The field test is described and the resulting data analyzed. Conclusions regarding the degree of success achieved in the sensor development are detailed. Problem areas remaining for the application of the sensing techniques are noted. Future actions to utilize the techniques developed are recommended. (Author)

N65-15379 Field 4B, 14E
CFSTI Prices: HC$3.00 MF$0.75

Rand Corp., Santa Monica, Calif.
AUTOMATIC PATTERN RECOGNITION OF METEOROLOGICAL SATELLITE CLOUD PHOTOGRAPHY,
by Y. H. Katz and W. L. Doyle. Dec 64, 95p
Memo. RM-3412-NASA
Contract NASr21
NASA CR-60318
Unclassified report

Descriptors: (*Meteorological satellites, Aerial photography), (*Cloud cover, Photo interpretation), (*Pattern recognition, Photo interpretation).

N65-17061 Field 4A, 8N
CFSTI Prices: HC$2.00 MF$0.50

State Univ. of Iowa, Iowa City. Dept. of Physics and Astronomy.
RECENT OBSERVATIONS OF ELECTRON INTENSITIES IN THE EARTH'S OUTER MAGNETOSPHERE AND BEYOND,
by L. A. Frank, J. W. Freeman, Jr., and J. A. Van Allen. 1963, 39p SUI-63-19
Contract NSG233-62
NASA CR-50462
Unclassified report

Presented at the Cospar Intern. Space SCI. Symp., Warsaw, 4 Jun 1963.

Descriptors: (*Upper atmosphere, Electrons), (*Terrestrial magnetism, Upper atmosphere).

N65-17064 Field 4A, 8N
CFSTI Prices: HC$3.00 MF$0.75

State Univ. of Iowa, Iowa City. Dept. of Physics and Astonomy.
A SURVEY OF MAGNETOSPHERIC BOUNDARY PHENOMENA,
by L. A. Frank and J. A. Van Allen. Aug 63, 64p
SUI-63-29
Contract NSG233 62
NASA CR-51070 Unclassified report

Presented at Symp. on Results of The IGY-IGC, Los Angeles.

Descriptors: (*Upper atmosphere, Boundary layer), (*Terrestrial magnetism, Upper atmosphere).

N65-19753 Field 4A, 4B
CFSTI Prices: HC$3.00 MF$0.50

Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
TURBULENCE IN THE UPPER ATMOSPHERE,
by C. G. Justus and H. D. Edwards. Jul 64, 56p
Contract NsG304 63, Proj. A652 001
NASA CR-57258

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Upper atmosphere, Turbulence), (*Atmospheric motion, Upper atmosphere).

N65-19756 Field 4A, 22A
CFSTI Prices: HC$2.00 MF$0.50

Illinois Univ., Urbana. Dept. of Electrical Engineering.
SCINTILLATION OBSERVATIONS OF SATELLITE SIGNALS,
by P. R. Kranz and K. C. Yeh. Jan 65, 33p
Contract NsG24 59
NASA CR-57219

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Satellites(Artificial), Radio signals), (*Radio signals, Atmospheric motion).

N65-19761 Field 4A, 20H
CFSTI Prices: HC$1.00 MF$0.50

Catholic Univ. of America, Washington, D. C. Dept. of Space Science and Applied Physics.
THE FERMI ACCELERATION OF CHARGED PARTICLES IN THE TRANSITION REGION BEYOND THE MAGNETOSPHERE,
by C. S. Shen and C. C. Chang. 24 Dec 64, 12p
Grant NsG417
NASA CR-57216

Unclassified report

Descriptors: (*Upper atmosphere, Terrestrial magnetism), (*Charged particles, Acceleration).

N65-21306 Field 4A, 3B
CFSTI Prices: HC$1.00 MF$0.50

Space Technology Labs., Redondo Beach, Calif. Physical Research Div.
A MODEL FOR A BROAD, DISORDERED TRANSITION BETWEEN THE SOLAR WIND AND THE MAGNETOSPHERE,
by W. Bernstein, P. W. Fredericks, and F. L. Scarf.
Jul 63, 15p
Contracts NASw698; AF49 636 886
NASA CR-57827

Unclassified report

Descriptors: (*Solar wind, Upper atmosphere), (*Upper atmosphere, Solar wind), Boundary layer transition.

N65-25971 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
NASA'S 150-METER METEOROLOGICAL TOWER LOCATED AT CAPE KENNEDY, FLORIDA,
by JohnW. Kaufman and LesterF. Keene.
12 May 65, 20p Rept. no. TMX-53259

Unclassified report

Descriptors: (*Weather stations, Towers), (*Towers, Weather stations).

N65-27948 Field 4A, 20C, 20N
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor.
INVESTIGATION OF NONLINEAR INTERACTION PHENOMENA IN THE IONOSPHERE,
by H. C. Hsieh, R. J. Lomax, and J. E. Rowe.
Jul 65, 80p
Grant NsG696
NASA CR-258

Unclassified report

Descriptors: (*Ionosphere, Electromagnetism), (*Electromagnetism, Ionosphere).

N65-29550--N65-29562 Field 4A
CFSTI Prices: HC$5.00

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
GODDARD SPACE FLIGHT CENTER CONTRIBUTIONS TO THE COSPAR MEETING, MAY 1964,
Jul 65, 179p NASA-TN-D-2798

Unclassified report

Descriptors: (*Space environmental conditions, Symposia), Scientific research, Upper atmosphere, Magnetic fields, Stratosphere, Charged particles, Temperature, Protons, X-rays, Solar flares, Meteorological satellites, Scientific satellites.

Patent 3,212,085 Field 4B

ATMOSPHERIC MOTION COHERENT PULSE DOPPLER RADAR SYSTEM.
Patent assigned to Air Force,
by Roger M. Lhermitte and David Atlas.
12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Doppler radar, Atmospheric sounding), (*Meteorological radar, Doppler radar), (*Atmospheric sounding, Doppler radar), Atmospheric motion, Clouds, Radar tracking, Radar reflections, Doppler effect, Patents.

Horizontal atmospheric motion or wind flow, is determined with the use of only one radar. Reflected Doppler signals contain a spectrum of frequencies. This spectrum is varied by a variety of factors including wind shear. The measurement utilizes pulse Doppler radar. The system can also be used to determine the fall velocity of moisture particles.

05. Behavioral and Social Sciences

N65-19750 Field 5A
CFSTI Prices: HC$4.00 MF$0.75

Missouri Univ., Columbia Research Center.
SCIENTIFIC RESEARCH IN MISSOURI,
by Donald A. Murry. Feb 65, 106p Ser.-5
Grant NGR 26 004 012
NASA CR-57232

Unclassified report

Descriptors: (*Missouri, Scientific research).

N65-23283 Field 5J, 22A
CFSTI Prices: HC$1.00 MF$0.50

Maryland Univ., College Park. Dept. of Psychology.
BEHAVIORAL RESEARCH AND EXPERIMENTAL ANALYSIS OF COMPLEX BEHAVIORAL REPERTOIRES UNDER FULL ENVIRONMENTAL CONTROL.
Semiannual status rept., 1 Oct 61-31 Mar 62,
by Joseph V. Brady and Jack D. Findley. 1962, 15p
Grant NsG 189-61
NASA CR-62606

Unclassified report

Descriptors: (*Behavior, Confined environments), (*Astronauts, Confined environments), (*Confined environments, Astronauts).

N65-26424 Field 5A
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge School of Industrial Management.
THE DESIGN OF RESEARCH AND DEVELOPMENT POLICY,
by Edward B. Roberts. 16 Jan 63, 42p CSCL-05A
Grant NsG235-62
NASA CR-63406

Unclassified report

Descriptors: (*Management planning, Research program administration), (*Research program administration, Management planning).

N65-27397 Field 5H
CFSTI Prices: HC$1.00 MF$0.50

Bunker-Ramo Corp., Canoga Park, Calif.
MEASUREMENT CRITERIA IN MAN MACHINE SYSTEMS SIMULATION,
by R. W. Obermayer. Jul 65, 21p
Contract NASw869
NASA CR-257

Unclassified report

Descriptors: (*Simulation, Measurement), (*Systems engineering, Measurement).

N65-28097 Field 5J, 6E, 6A
CFSTI Prices: HC$1.00 MF$0.50

California Univ., Los Angeles. Neuropsychiatric Inst.
MOOD, MOTILITY AND 17-HYDROXYCORTICOID EXCRETION-A POLYVARIABLE CASE STUDY,
by Melvin Schwartz, Arnold J. Mandell, Richard Green, and Richard Ferman. 1965, 19p
Grant NsG237-62
NASA CR-63785 Unclassified report

Descriptors: (*Pyschoses, Corticosteroid agents), (*Corticosteroid agents, Excretion).

Patent 3,205,293 Field 5I, 17I

INSTRUCTIONAL DEVICE FOR SIMULATED CODED TARGET IDENTIFICATION SIGNALS.
Patent assigned to Navy,
by Joseph J. Zyskowski. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Radar trainers, Identification systems), (*Identification systems, Simulation), Coding, Aircraft interception, Target acquisition, Radar target position simulators, Radar equipment, Target recognition, Patents.

The apparatus simulates IFF signals generated by mobile aircraft and is used in training personnel in the use of the IFF equipment. The overall simulator device contains structure and mechanism for covering acquisition track and killing phases of air defense problems to be solved by a training radar crew operating a respective air defense fire distribution system in conjunction with a device as programmed by the instructor. Simulated airborne target flight paths are generated as a result of manual inputs to target coordinate generators by the device operator. Necessary data for manual inputs is obtained, and a Nike missile trajectory is automatically generated from tracking data supplied by the Nike fire distribution system.

PB-168 499 Field 5B
CFSTI Prices: HC$7.00 MF$1.75

Harvard Univ., Cambridge, Mass. Computation Lab.
INFORMATION STORAGE AND RETRIEVAL.
Aug 65, 367p Scientific rept. no. ISR-9

Unclassified report

Available copy will not permit fully legible reproduction. See also PB-166 807.

Descriptors: (*Information retrieval, Data processing systems), (*Programming(Computers), Information retrieval), Documentation, Dictionaries, Subject indexing, Reports, Optimization, Search theory, Iterative methods, Feasibility studies.

Contents: Progress report on SMART; General discussion of the logical properties of the SMART system; Specific description of the new SMART system; Specification input to the revised SMART system; Dictionary look-up system for SMART; Dictionary setup procedures for SMART; Statistical phrase processing for SMART clustering program; Updating the criterion free file of SMART; Revised syntactic processing for SMART; Syntactic analysis of incomplete sentences in the SMART system; Tree matching program--MATCH; Vector merging and vector correlations; Concept-concept and document-document correlations; Hierarchy setup and hierarchy and concept-concept expansion procedures; Reports format; Evaluation of retrieval results in the extended SMART system; Program to evaluate the iterative search process (MORVAL); Combinations of analysis methods--the merged output results; Analysis of student requests; Evaluation viewpoints in document retrieval; Distinguishing retrieved from nonretrieved information: the cutoff problem; Relevance feedback in information retrieval; Information search optimization and iterative retrieval techniques.

PB-168 510 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Harvard Univ., Cambridge, Mass. Computation Lab.
THE TRIAL TRANSLATOR, AN AUTOMATIC PROGRAMMING SYSTEM FOR EXPERIMENTAL RUSSIAN-ENGLISH MACHINE TRANSLATION,
by V. E. Giuliano. 1958, 7p
Unclassified report

Pub. in Proceedings of the Eastern Joint Computer Conference Philadelphia p138-44 3-5 Dec 1958.

Descriptors: (*Machine translation, Programming-(Computers)), (*Programming(Computers), Machine translation), Automatic, Dictionaries, Mathematical logic.

The Trial Translator is for the automatic testing of translation algorithms. This system accepts as its inputs, a set of experimental translation algorithms expressed in a suitable pseudocode language, and a large body of Russian technical text. The system applies the algorithms to the text and produces, as its output, a readable trial translation, the English text resulting from the application of the given rules to the given text. The Trial Translator contains three main subsystems, the Automatic Dictionary, the Formula Inserter, and the Specifier-Evaluator-Editor.

PB-168 550 Field 5G
CFSTI Prices: HC$5.00 MF$1.00

Harvard Univ., Cambridge. Computation Lab.
MATHEMATICAL LINGUISTICS AND AUTOMATIC TRANSLATION,
by Anthony G. Oettinger. Aug 65, 154p
NSF 15
Unclassified report

Descriptors: (*Machine translation, Language), (*Language, Mathematical analysis), Automata, Programming(Computers), Pattern recognition, Vocabulary, Mathematical prediction, Data processing systems.

Contents: Current research in computational and mathematical linguistics; Code sets and context-free languages; Predictive analyzer and context-free grammars; System for transformational analysis; Automatic sentence kernelization.

SC-R-64-1338 Field 5H, 5J
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THERP,
by A. D. Swain. Oct 64, 9p
Contract AT(29-1)-789
Unclassified report

Presented at The Symposium on the Qualification of Human Performance, Univ. of New Mexico, Albuquerque, 17-19 Aug 1964.

Descriptors: (*Performance(Human), Mathematical prediction), (*Mathematical models, Performance-(Human)).

Y-PB-98 Field 5A, 13H
CFSTI Prices: HC$3.00 MF$0.75

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
CRITICAL PATH SCHEDULING AS APPLIED TO SPECIAL FABRICATION,
by F. E. Baker, N. H. Bethea, and A. L. Strickland.
May 65, 56p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Scheduling, Manufacturing methods), (*Manufacturing methods, Management planning).

06. Biological and Medical Sciences

ABCC-15-63 Field 6R
CFSTI Prices: HC$2.00 MF$0.50

Atomic Bomb Casualty Commission, Hiroshima (Japan).
JNIH-ABCC LIFE SPAN STUDY OF HIROSHIMA AND NAGASAKI. MORTALITY.
Rept. no. 3, 6 Oct 50-Sep 60,
by Seymor Jablon, Morihiro Ishida and Mitsuru Yamasaki. 11 Jun 63, 51p
Contract AT(40-1)-GEN-72
Unclassified report

Descriptors: (*Life span, Radiation effects), (*Radiation effects, Life spans, Japan.

BNL-7916 Field 6E
CFSTI Prices: HC$2.00 MF$0.50

Veterans Administration Hospital, Dallas, Tex.
IN VITRO DNA LABELING OF BONE MARROW AND LEUKEMIC BLOOD LEUKOCYTES WITH TRITIATED THYMIDINE. I. PHYSICAL AND CHEMICAL FACTORS WHICH AFFECT AUTORADIOGRAPHIC CELL LABELING,
by J. R. Ribini, S. Keller, and E. P. Cronkite.
1963, 46p
Contract AT-30-2-GEN-16
Unclassified report

Presented in Part at European Congress of Hematology, Aug. 1963.

Descriptors: (*Desoxyribonucleic acids, Labeled substances), (*Leukocytes, Labeled substances), (*Leukemia, Desoxyribonucleic acids), Autoradiography, Nucleosides.

BNL-8203 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Yale Univ., New Haven, Conn. School of Forestry.
EXPERIMENTAL AND DEVELOPMENTAL MORPHOGENESIS IN PINUS. I. THE ROLE OF THE COTYLEDONS AND ORIENTATION ON EMBRYO GROWTH IN VITRO,
by Graeme P. Berlyn and Jerome P. Miksche.
1964, 28p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Trees, Embryos), (*Embryos, Growth).

BNL-8360 Field 6A, 18B, 7E
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
COMPUTER CORRECTION OF BACKGROUND IN RADIOAUTOGRAPHY WITH TRITIATED THYMIDINE,

by F. Bresciani and K. Thompson. 1963, 13p
Contract AT-30-2-GEN-16
Unclassified report

Prepared in cooperation with Naples Univ. (Italy).

Descriptors: (*Autobiography, Nucleosides), (*Desoxyribonucleic acids, Autoradiography).

BNL-9188 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
RADIATION TOLERANCE FROM FALLOUT IN PROTECTIVE STRUCTURES.
by Robert A. Conard. 1965, 11p CONF-650515-1
Contract AT-30-2-GEN-16
Unclassified report

Presented at National Academy of Sciences Protective Structures Symposium, Washington, D. C., 20 Apr 1965.

Descriptors: (*Radioactive fallout, Radiation tolerance), (*Radiation tolerance, Shelters).

COO-1296-1 Field 6C, 6R, 18C
CFSTI Prices: HC$2.00 MF$0.50

Missouri Univ., Columbia.
THE REVEGETATION AT THE NEW MEXICO ATOMIC BOMB CRATER,
by David B. Dunn and David L. Spellman. 1964, 47p
Contract AT(11-1)-1296
Unclassified report

Descriptors: (*Plants(Botany), Nuclear explosion damage), Ecology, New Mexico, Radiation effects.

COO-1318-1 Field 6R
CFSTI Prices: HC$4.00 MF$1.00

Industrial Bio-Test Labs., Inc., Northbrook, Ill.
90-DAY SUBACUTE ORAL TOXICITY STUDIES ON RADIATION-PASTEURIZED FOODS (STRAWBERRIES, APPLES AND PEARS).
Final rept.,
by J. C. Calandra and Margaret Ives. 1965, 143p
Contract AT(11-1)-1316
Unclassified report

Descriptors: (*Irradiated foods, Toxicity), (*Fruits, Irradiated foods).

IDO-10042 Field 6H, 6R
CFSTI Prices: HC$2.00 MF$0.50

Western Nuclear Corp., Idaho Falls, Idaho.
SUITABILITY OF POTATO PRODUCTS PREPARED FROM IRRADIATED AND CHEMICALLY INHIBITED POTATOES,
by George A. Freund. Feb 65, 37p Unclassified report
Contract AT(10-1)-1198
Prepared in cooperation with Engineering Committee, Potato Processors of Idaho.

Descriptors: (*Irradiated foods, Potatoes), (*Potatoes, Irradiated foods).

LA-3365 Field 6R, 22A
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SOME BIOLOGICAL ASPECTS OF RADIOACTIVE MICROSPHERES.
20 Jul 65, 67p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Radiobiology, Radiation hazards), Particle size.

N65-17053 Field 6C, 6S, 22A
CFSTI Prices: HC$1.00 MF$0.50

Washington Univ., Seattle. Coll. of Fisheries.
DAPHNIA SURVIVAL STUDIES.
Progress rept. no. 1, 1 Nov 63-1 May 64,
by F. B. Taub. 1964, 19p
Grant NSG 519
NASA CR-56112
Unclassified report

Descriptors: (*Crustacea, Space flight), (*Reproduction-(Physiology), Space flight).

N65-17054 Field 6A, 8G, 6C
CFSTI Prices: HC$1.00 MF$0.50

State Univ. of New York, Buffalo. School of Medicine.
PRIMITIVE EARTH SYNTHESIS OF AMINO ACIDS AND POLYPEPTIDES.
Status rept. 1 Jul-31 Dec 63,
by C. U. Lowe. 30 Jan 64, 3p
NSG476
NASA CR-53134
Unclassified report

Descriptors: (*Amino acids, Biosynthesis), (*Peptides, Biosynthesis).

N65-17055 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Nevada Univ., Reno.
EXPERIMENTS ON THE EFFECTS OF LOW PRESSURES ON CELLULAR ULTRASTRUCTURE AND CYTOCHEMISTRY IN PLANTS.
Semiannual progress rept., 1 Apr-30 Sep 63,
by H. N. Mozingo. 1963, 11p
Grant NsG 464 Unclassified report
NASA CR-55179
Descriptors: (*Plants(Botany), Cytochemistry), (*Cytochemistry, Low-pressure research).

N65-17067 Field 6K, 6C, 6F
CFSTI Prices: HC$1.00 MF$0.50

Colorado State Univ., Fort Collins. Dept. of Botany and Plant Pathology.
THE USE OF PATHOGEN-FREE PLANTS IN A MICROCOSM. THE EFFECTS OF HIGH INTENSITY LIGHT ON PLANT GROWTH,
by R. Baker. 12 Dec 62, 4p
NSG78-60
NASA CR-50170
Unclassified report

Descriptors: (*Germ-free atmospheres, Plants-(Biology)), (*Plants(Biology), Growth).

N65-21424 Field 6S
CFSTI Prices: HC$5.00 MF$2.50

Library of Congress, Washington, D. C. Science and Technology Div.

AEROSPACE MEDICINE AND BIOLOGY, AN ANNOTATED BIBLIOGRAPHY, VOLUME XI. 1962-1963 LITERATURE,
by Leroy D. Davis, Kristallo V. Pappajohn, Paul E. Spiegler, Ilga M. Terauds, and Elaine S. Valliere.
1965, 494p

Unclassified report

Descriptors: (*Space medicine, Bibliographies), (*Space biology, Bibliographies), Subject indexing, Indexes.

N65-21756 Field 6S, 5E, 1B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
EFFECTS OF GUST-INDUCED AND MANEUVERING ACCELERATION STRESS ON PILOT VEHICLE PERFORMANCE,
by Thomas E. Wempe. 1964, 41p
Rept. no. TMX-51748

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Pilots, Performance(Human)), (*Stress-(Physiology), Pilots).

N65-22551 Field 6C, 12A
CFSTI Prices: HC$2.00 MF$0.50

Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
HEREDITARY DEPENDENCE IN THE THEORY OF DIFFERENTIAL EQUATIONS, PART I,
by G. Stephen Jones. Jan 65, 43p Rept. no. BN-385
Contracts NASw 845, AF 49 638 1242
NASA CR-62399

Unclassified report

Descriptors: (*Genetics, Differential equations), (*Differential equations, Genetics).

N65-22616 Field 6C, 6S
CFSTI Prices: HC$5.00 MF$1.00

Marquardt Corp., Van Nuys, Calif.
STUDY OF EXTRATERRESTRIAL LIFE DETECTION CONCEPT,
by G. E. Ellis. Dec 64, 153p Rept. no. 25146
Contract NASw 810
NASA CR-62003

Unclassified report

Descriptors: (*Space biology, Monitors), (*Bacteria, Space biology), Escherichia coli, Spirillaceae.

N65-25590 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

Brandeis Univ., Waltham, Mass. Dept. of Biochemistry.
A COMPARATIVE STUDY OF THE EVOLUTION OF ENZYMES AND NUCLEIC ACIDS,
Semi-Annual status rept. 1 Nov. 64-30 Apr 65,
by Nathan O. Kaplan, Lawrence Levine, and Lawrence Grossman. 1965, 3p
Grant NsG375
NASA CR-63246

Unclassified report

Descriptors: (*Enzymes, Nucleic acids), (*Nucleic acids, Enzymes).

N65-26418 Field 6Q
CFSTI Prices: HC$2.00 MF$0.50

Northrop Space Labs., Hawthorne, Calif.
FEASIBILITY STUDY OF INTEGRAL HEAT SINK SPACE SUIT CONCEPTS,
by A. P. Shlosinger and W. Woo. May 65, 28p
NSL-65-87-2
Contract NAS2 2102
NASA CR-63399

Unclassified report

Descriptors: (*Protective clothing, Heat transfer), (*Body temperature, Protective clothing).

N65-28346 Field 6S, 6C, 22A
CFSTI Prices: HC$2.00 MF$0.50

Oklahoma City Univ., Okla.
INTERDISCIPLINARY STUDIES OF THE EFFECTS OF THE SPACE ENVIRONMENT ON BIOLOGICAL SYSTEMS.
Semiannual status rept.
30 Apr 65, 50p CSCL-06S
Grant NsG 300-63
NASA CR-63790

Unclassified report

Descriptors: (*Space biology, Metabolism).

N65-29648 Field 6S
CFSTI Prices: HC$1.00 MF$1.00

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY.
May 65, 179p
NASA SP-7011(11)

Unclassified report

Descriptors: (*Space medicine, Bibliographies), (*Space biology, Bibliographies), Subject indexing, Indexes.

N65-29649 Field 6S
CFSTI Prices: HC$1.00 MF$0.75

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY.
Jun65, 104p NASA-SP-7011(12)

Unclassified report

Descriptors: (*Space medicine, Bibliographies), (*Space biology, Bibliographies), Subject indexing, Indexes.

NYO-901-33 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
LOW DOSE I-131 INHIBITION OF H3TDN INCORPORATION BY MOUSE THYROID CELLS,
by David L. Joftes. 16 Jun 65, 10p
Contract AT(30-1)-901

Unclassified report

Descriptors: (*Radiation effects, Thyroid gland), (*Thyroid gland, Radiation effects).

NYO-1726-14 Field 6L, 6E, 6R
CFSTI Prices: HC$1.00 MF$0.50

New England Medical Center Hospitals, Boston, Mass.
DEVELOPMENT OF SMALL IN VIVO BETA-RAY DETECTORS AND THEIR DIAGNOSTIC APPLICATIONS. EVALUATION PROGRAM AT NEUROSURGICAL CENTERS OF BRAIN TUMOR LOCALIZATION UNITS USED AT OPERATION WITH P 32.
Progress rept. 15 May 63-14 May 65,
by Bertram Selverstone. 1965, 14p
Contract AT(30-1)-1726

Unclassified report

Descriptors: (*Surgical techniques, Brain), (*Brain, Neoplasms), (*Radiation monitors, Neoplasms).

NYO-2456-1 Field 6P
CFSTI Prices: HC$1.00 MF$0.50

Columbia Univ., New York. Dept. of Ophthalmology.
TRANSPORT AND METABOLISM OF ISOTOPICALLY LABELED MATERIALS IN THE EYE.
Final rept.
1965, 6p
Contract AT(30-1)-2456

Unclassified report

Descriptors: (*Radioactive isotopes, Eye), (*Eye, Labeled substances).

NYO-3364-4 Field 6R, 4B
CFSTI Prices: HC$2.00 MF$0.50

Norsk Hydros Inst. for Cancer Research, Oslo (Norway).
THE CORRELATION BETWEEN THE PRECIPITATION AND THE AMOUNT OF 137 CS IN MILK IN NORWAY,
by Kjell Madshus and Aksel Stroemme. 1964, 22p
Contract AT(30-1)-3364

Unclassified report

Descriptors: (*Radiological contamination, Milk), (*Milk, Radiological contamination), (*Atmospheric precipitation, Radiological contamination).

ORNL-3768 Field 6C
CFSTI Prices: HC$6.00 MF$1.25

Oak Ridge National Lab., Tenn.
BIOLOGY DIVISION.
Semiannual progress rept. for the period ending 15 Feb 65.
May 65, 205p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Biology, Scientific research).

ORNL-TM-1136 Field 6R
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
OPERATING EXPERIENCE OF THE NUCLEAR SAFETY INFORMATION CENTER, MARCH 1963 - MARCH 1965,
by J. R. Buchanan and Wm. B. Cottrell. 17 May 65, 57p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Nuclear physics laboratories, Safety).

ORNL-TM-1162 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
CONTAINMENT CRITERIA FOR LABORATORIES HANDLING INFECTIOUS AGENTS,
by R. C. Allen, N. E. Bolton, T. A. Lincoln, and A. C. Upton. May 65, 21p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Biological laboratories, Hazards), (*Safety, Biological laboratories).

Patent 3,167,485 Field 6A

WATER INSOLUBLE MODIFIED ENZYMES.
Patent assigned to HEW,
by Efraim Katchalski and Estelle Bar-Eli. 26 Jan 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Enzymes, Chemical bonds), (*Papain, Solubility), (*Trypsin, Solubility), (*Chymotrypsin, Solubility), (*Urease, Solubility), Amino acids, Phenylalinine, Copolymerization, Glycols, Cellulose, Hydrolysis, Patents.

The enzymatically active, water-insoluble substance consists of an enzyme such as trypsin, chemotrypsin, or papain bonded covalently to a water-insoluble copolymer of L-leucine and p-amino phenyl-DL-alanine. Yet another embodiment consists of urease bonded through modified polyethylene glycol chains to cellulose. Such preparations may be used repeatedly for effecting enzymic processes, for example by using them (plus an extended) in a column through which a substrate is passed.

Patent 3,205,130 Field 6F

PHOSPHORAMIDES AND THIOPHOSPHORAMIDES AS INSECT CHEMOSTERILANTS.
Patent assigned to Agriculture,
by Paul H. Terry and Alexej B. Borkovec.
7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Organic phosphorus compounds, Pest control), (*Organic sulfur compounds, Pest control), (*Pest control, Reproduction(Physiology)), (*Reproduction(Physiology), Inhibition), Musca, Coleoptera, Aedes, Drosophilidae, Lepidoptera, Diptera, Amides, Cobalt compounds, Chlorides, Complex compounds, Patents.

The compounds are effective as insect sterilants by suppressing oviposition, by reducing or eliminating hatch of eggs, or by causing death of larvae which hatch from eggs laid by insects contacted by the compounds. The compound may be hexamethylphosphoramide, the cobaltous chloride complex of hexamethylphosphoramide, N,N:N''-trimethyl-N,N;N''-triethylphosphoramide, N,N,N; N'-tetramethyl-P-piperidinophosphonic diamide, or their thiophosphoroanalogs.

Patent 3,208,909 Field 6O, 6M

ANAEROBIC PROCESS FOR PRODUCTION OF A GEL-ADSORBED ANTHRAX IMMUNIZNG ANTIGEN.
Patent assigned to Army,
by Milton Puziss and George G. Wright. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Antigens + antibodies, Production), (*Bacillus anthracis, Antigens + antibodies), Gels, Adsorption, Culture media, Immunization, Carbohydrates, Amino acids, Salts, Spores, Phosphates, Iron compounds, Sulfates, Vitamin B complex, Patents.

The nonviable anthrax immunizing antigen is suitable for use in human immunization. It is prepared in a medium containing carbohydrate, amino acids, magnesium, calcium, ferrous and manganous salts. The medium is sterilized by autoclaving and sodium bicarbonate is added. The medium is inoculated with a spore suspension of Bacillus anthracis and cultured. Other steps include pH adjustment, filtering, the addition of a sterile solution and the stabilization of the antigen.

PB-168 471 Field 6R, 18G, 18F
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
EXPERIMENTAL CONTAMINATION OF PINK SHRIMPS BY CESIUM 137 (Contamination Experimentale de Crevettes Roses par le Cesium 137),
by Jacques Ancellin, Georges Michon, and Alain Vilquin. 1965, 18p Rept. no. CEA-R-2818
Unclassified report

Text in French attached summary in English.

Descriptors: (*Crustacea, Radiological contamination), (*Cesium, Radiological contamination), Radioactive waste, Isotopes, Determination, France.

The technique used for the determination of 137Cs concentration factors in the pink shrimp (Leander Serratus Pennant is described. Experiments over three months have shown that the specific activity of the shrimps becomes stable between the 30th and the 40th day. The concentration factors then have values between 30 and 40. These results are similar to those obtained recently by other authors. (Author)

PB-168 589 Field 6C
CFSTI Prices: HC$10.95 MF$3.00

Forest Service, Washington, D. C.
RANGE PLANT HANDBOOK. Unclassified report
Mar 37, 791p
Original document contains color other than black and white. Available in black and white only.

Descriptors: (*Plants(Botany), Handbooks), Ecology, Morphology(Biology), Grasses, United States.

The range plant handbook employs a novel method whereby the technical, diagnostic parts of a plant are portrayed in a manner readily comprehensible by a person untrained in botany. The handbook presents 339 generic and specific write-ups incorporated with which, however, are notes on over 500 additional species. The main treatments include 98 grasses, 8 grasslike plants (chiefly sedges and rushes), 137 range weeds (nongrasslike herbs), and 96 browse plants.

PNE-402 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Arctic Health Research Center, Anchorage, Alaska.
PROJECT CHARIOT--ENVIRONMENTAL PROGRAM.
Preliminary rept. Unclassified report
6 Dec 60, 44p

Descriptors: (*Birds, Alaska), Ecology.

PNE-408 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Alaska Univ., College.
MAMMAL INVESTIGATIONS, CARIBOU.
Supplementary progress rept.,
by Peter C. Lent. 4 Jan 60, 5p
Contract AT(04-3)-310
Unclassified report

Descriptors: (*Mammals, Alaska), Ecology.

PNE-410 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Alaska Univ., College.
CARIBOU INVESTIGATIONS, NORTHWEST ALASKA.
Progress letter,
by Peter C. Lent. Sep 60, 11p
Contract AT(04-3)-310
Unclassified report

Descriptors: (*Mammals, Alaska), Ecology.

PNE-411 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Alaska Univ., College. Dept. of Biological Sciences.
CARIBOU INVESTIGATIONS, NORTHWEST ALASKA. PHASE III.
Progress rept.,
by Peter C. Lent. Dec 60, 71p
Contract AT(04-3)-310
Unclassified report

Rept. on project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-414 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Alaska Univ., College. Dept. of Biological Sciences.
TERRESTRIAL MAMMALS INVESTIGATION OGOTORUK CREEK-CAPE THOMPSON AND VICINITY. PART C. CARIBOU INVESTIGATIONS, NORTHWEST ALASKA.
Final rept., Suppl., 21 May-5 Jul 62,
by Peter C. Lent. Oct 62, 11p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-415 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College. Dept. of Biological Sciences.
ANALYSIS OF PLANT MATERIALS IN THE RUMEN OF CARIBOU OF NORTHWESTERN ALASKA.
Final rept.,
by Lloyd H. Swift and Richard H. Bishop. Jun 63, 31p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Mammals, Alaska), (*Plants(Botany), Alaska), (*Food, Mammals).

PNE-416 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College.
OGOTORUK VALLEY -- MAMMAL INVESTIGATIONS.
Progress rept.,
by William O. Pruitt, Jr. Dec 59, 26p
Contract AT(04-3)-310
Unclassified report

Descriptors: (*Mammals, Alaska), Ecology.

PNE-418 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College. Dept. of Biological Sciences.
TERRESTRIAL MAMMAL INVESTIGATIONS, OGOTORUK CREEK-CAPE THOMPSON AND VICINITY. PHASE III.
Progress rept.,
by William O. Pruitt, Jr., Peter C. Lent, and Ernest A. Carl. Dec 60, 46p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-419 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Alaska Univ., College. Dept. of Biological Sciences.
TERRESTRIAL MAMMAL INVESTIGATIONS, OGOTORUK CREEK-CAPE THOMPSON AND VICINITY. PHASE III.
Progress rept.,
by William O. Pruitt, Jr., Peter C. Lent, and Ernest A. Carl. Jun 61, 59p Unclassified report
Contract AT(04-3)-310
Report on Project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-420 Field 6C
CFSTI Prices: HC$5.00 MF$1.00

Alaska Univ., College. Dept. of Biological Sciences.
TERRESTRIAL MAMMALS INVESTIGATION, OGOTORUK CREEK-CAPE THOMPSON AND VICINITY. PART A. GENERAL STUDIES AND SMALL MAMMAL BIOLOGY.
Final rept.,
by William O. Pruitt, Jr. Jan 62, 157p
Contract AT(07-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-421 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Alaska Univ., College. Dept. of Biological Sciences.
TERRESTRIAL MAMMALS INVESTIGATION, OGOTORUK CREEK-CAPE THOMPSON AND VICINITY. PART B. ECOLOGY OF THE ARCTIC GROUND SQUIRREL CITELLUS PARRYI.
Final rept.,
by Ernest A. Carl. Jun 62, 92p Unclassified report
Contract AT(04-3)-310
Report on Project Chariot.

Descriptors: (*Mammals, Alaska), Ecology.

PNE-423 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College.
HUMAN ECOLOGY INVESTIGATIONS, KIVALINA, ALASKA. PHASE II.
Interim final rept.,
by Doris J. Saario. Jun 60, 31p
Contract AT(04-3)-310
Unclassified report

Descriptors: (*Humans, Alaska), (*Ecology, Humans).

PNE-424 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College. Dept. of Biological Sciences.
HUMAN ECOLOGICAL INVESTIGATIONS AT KIVALINA, ALASKA. PHASE III.
Progress rept.,
by Doris J. Saario. Mar 61, 28p
Contract AT(04-3)-310
Report on Project Chariot. Unclassified report

Descriptors: (*Humans, Alaska), (*Ecology, Humans).

PNE-427 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College.
SEA CLIFF BIRDS PROJECT. PHASE II.
Interim final rept.,
by Gerard L. Swartz. Jun 60, 28p
Contract AT(04-3)-310
Unclassified report

Descriptors: (*Birds, Alaska), Ecology.

PNE-429 Field 6C
CFSTI Prices: HC$2.00 MF$0.75

Alaska Univ., College. Dept. of Biological Sciences.
INVESTIGATIONS OF SEA-CLIFF BIRDS, CAPE THOMPSON, ALASKA.
Progress rept., Phase 3,
by L. G. Swartz and G. W. Cox. Dec 60, 81p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Birds, Alaska), Ecology.

PNE-431 Field 6C
CFSTI Prices: HC$4.00 MF$1.00

Alaska Univ., College. Dept. of Biological Sciences.
INVESTIGATION OF SEA-CLIFF BIRDS, CAPE THOMPSON, ALASKA.
Final rept.,
by L. Gerard Swartz. May 64, 133p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Birds, Alaska), Ecology.

PNE-437 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Alaska Univ., College. Dept. of Biological Sciences.

OGOTORUK CREEK BOTANICAL INVESTIGATIONS, CAPE THOMPSON, ALASKA. PART B. THE EFFECTS OF ARCTIC GROUND SQUIRRELS ON THE VEGETATION OF OGOTORUK CREEK VALLEY.
Progress rept., Phase 3,
by Herbert R. Melchior. Jun 61, 39p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Plants(Botany), Alaska), Ecology.

PNE-438 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Alaska Univ., College. Dept. of Biological Sciences.
OGOTORUK CREEK BOTANICAL INVESTIGATIONS. INFLUENCE OF FROST ACTION ON THE VEGETATION OF OGOTORUK CREEK VALLEY.
Final progress rept.,
by Bonita J. Neiland, Albert W. Johnson, and Ross E. Johnson. Jun 62, 51p
Contract AT(04-3)-310
Unclassified report

Report on Project Chariot.

Descriptors: (*Plants(Botany), Alaska), Ecology.

PNE-465 Field 6R, 6C
CFSTI Prices: HC$1.00 MF$0.50

Washington Univ., Seattle. Lab. of Radiation Biology.
1961 SALMON SURVEY, PROJECT CHARIOT.
1961, 11p
Contract AT(45-1)-540
Unclassified report

Descriptors: (*Radiobiology, Fishes), (*Fishes, Radiobiology).

TID-21284 Field 6R, 18G
CFSTI Prices: HC$1.00 MF$0.50

Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE FOR THE TORY II-C TESTS.
Final rept.,
ed. by R. Dennis Tate. 1 Sep 64, 17p SWRHL-10R
Unclassified report

Descriptors: (*Radiation monitors, Public health), (*Nuclear reactors, Radiological contamination).

TID-21431 Field 6H, 6R, 13H
CFSTI Prices: HC$0.55 MF$1.00

Business and Defense Services Administration, Washington, D. C.
CURRENT STATUS AND COMMERCIAL PROSPECTS FOR RADIATION PRESERVATION OF FOOD.
Jan 65, 184p
Contract AT(49-11)-2524
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.55 HC.

Descriptors: (*Irradiated foods, Industries).

TID-21617 Field 6C, 4B
CFSTI Prices: HC$5.00 MF$1.00

Ohio State Univ., Columbus. Dept. of Botany and Plant Pathology.
BIOCLIMATIC AND SOILS INVESTIGATIONS IN FOREST ENVIRONMENTS. X. RING ANALYSIS OF SELECTED TREES AT NEOTOMA.
Final rept.,
by Richard L. Phipps. Aug 64, 166p
Contract AT(11-1)-552
Unclassified report

Prepared in cooperation with Ohio Agricultural Experiment Station, Wooster, Ohio.

Descriptors: (*Plants(Botany), Climatology), (*Climatology, Plants(Botany)), Soils.

TID-21727 Field 6R
CFSTI Prices: HC$3.00 MF$0.75

Washington Univ., Seattle. Dept. of Physiology and Biophysics.
IONIZING RADIATION STUDIES ON MICE.
Final rept.,
by Leo K. Bustad, Noel M. Gates, Frances C. Replogle, Alan Ross, and Loren D. Carlson. 30 Dec 64, 100p
Contract AT(45-1)-1094
Unclassified report

Descriptors: (*Radiation effects, Mice).

TID-21796 Field 6H, 6R
CFSTI Prices: HC$1.00 MF$0.50

Virginia Univ., Charlottesville.
RADIOISOTOPE REMOVAL FROM MILK.
Final rept. 1 Jun 63 - 30 Nov 64,
by B. Vant Riet. 30 Nov 64, 14p
Contract AT(40-1)-3117
Unclassified report

Descriptors: (*Milk, Radioactive isotopes), (*Radioactive isotopes, Milk).

TID-21799 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Chester Beatty Research Inst., London (England).
TISSUE THERAPY AFTER IRRADIATION,
by P. C. Koller. 1964, 14p
Contract IAEA-103/3/US
Unclassified report

Descriptors: (*Radiation effects, Tissues(Biology)), (*Tissues(Biology), Radiation effects).

TID-21839 Field 6A
CFSTI Prices: HC$4.00 MF$0.75

Michigan State Univ., Ann Arbor.
THE BIOSYNTHESIS OF TERTHIENYL IN THE COMMON MARIGOLD.
Doctoral thesis,
by Terry Bill Waggoner. 1963, 102p
Contract AT(11-1)-1034
Unclassified report

Descriptors: (*Plants(Botany), Biosynthesis), (*S-heterocyclic compounds, Biosynthesis).

TID-21857 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

Michigan State Univ., East Lansing.
A STUDY OF THE BIOSYNTHESIS OF TERTHIENYL,
by S. M. de Paul Palaszek. 1964, 23p
Contract AT(11-1)-698

Unclassified report

Descriptors: (*Biosynthesis, Organic sulfur compounds), (*Organic sulfur compounds, Biosynthesis).

TID-21859 Field 6R
CFSTI Prices: HC$3.00 MF$0.75

Worcester Foundation for experimental biology, Shrewsbury, Mass.
STEROID HORMONES IN RELATION TO IRRADIATION.
Progress rept. for 1950-1963,
by Ralph I. Dorfman. 15 Feb 63, 72p
Contract AT(30-1)-918

Unclassified report

Descriptors: (*Steroids, Radiation effects), (*Radiation effects, Steroids).

TID-21862 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Northrop Space Labs., Hawthorne, Calif.
PERSISTENT RADIATION-INDUCED CHROMOSOMAL CHANGES IN NATIVE POCKET MOUSE POPULATIONS OF THE NEVADA TEST SITE.
Summary rept. for18 Apr 64 - 18 Apr 65,
by Joseph W. Towner and Robert G. Lindberg.
Apr 65, 17p NSL-64-136-1
Contract AT(04-3)-510

Unclassified report

Descriptors: (*Chromosomes, Radiation effects), (*Radiation effects, Chromosomes).

TID-21870 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts General Hospital, Boston.
THE BIOLOGIC EFFECTS OF RADIATION ON THYROID TISSUE.
Final rept. for 1 Jul 49 - 14 May 64,
by Oliver Cope. May 65, 12p
Contract AT(30-1)-667

Unclassified report

Descriptors: (*Radiation effects, Thyroid gland), (*Thyroid gland, Radiation effects).

TID-21871 Field 6R
CFSTI Prices: HC$4.00 MF$0.75

Chester Beatty Research Inst., London (England).
SYNGENEIC HAEMATOPOIETIC THERAPY IN MICE,
by A. M. Cross. 1965, 105p
Contract AT(30-1)-2702

Unclassified report

Descriptors: (*Hemopoietic system, Radiation effects), (*Radiation effects, Hemopoietic system).

TID-21877 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

College of Southern Utah, Cedar City.
THE EFFECTS OF-X IRRADIATION ON INVERTEBRATE EMBRYOS.
Technical rept.,
by Wesley Larsen. 1965, 13p
Contract AT(11-1)-1030

Unclassified report

Descriptors: (*Embryos, Radiation effects), (*Radiation effects, Embryos), Invertebrates.

UCRL-7896 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
PALMITYL-COENZYME A INHIBITION OF THE CITRATE-CONDENSING ENZYME,
by Paul A. Srere. 22 May 64, 21p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Coenzymes, Inhibition).

UCRL-8268 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Donner Lab., California Univ. Berkeley.
THE ACTION OF PENETRATING RADIATIONS ON YEAST CELLS,
by Cornelius A. Tobias, Robert K. Mortimer, and Ralph L. Gunther. 1965, 18p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Yeasts, Radiation effects), (*Radiation effects, Yeasts).

UCRL-16030 Field 6R
CFSTI Prices: HC$2.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
DARK RECOVERY OF YEAST FOLLOWING IONIZING RADIATIONS.
Doctoral thesis,
by John T. Lyman. 30 Mar 65, 77p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Yeasts, Radiation effects), (*Radiation effects, Yeasts).

07. Chemistry

BNL-9043 Field 7E, 7C
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CHARACTERIZATION STUDIES FOR POLYETHYLENE FORMED BY CO 60 GAMMA RADIATION UNDER CONSTANT CONDITIONS IN A NON-FLOW SYSTEM,
by P. Colombo, J. Fontana, L. E. Kukacka, and M. Steinberg. Mar 65, 35p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Polyethylene plastics, Polymerization), (*Radiation chemistry, Polyethylene plastics), Radioactive isotopes.

BNL-9111 Field 7D, 20B
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
EFFECT OF HYDROSTATIC PRESSURE ON HYPERFINE STRUCTURE OF S STATE WAVE-FUNCTIONS IN IONIC CRYSTALS H AND D IN CAF2, F CENTERS IN LIF,
by Haywood Blum. 1964, 19p CONF-650423-2
Contract AT-30-2-GEN-16

Unclassified report

Prepared from International Conference on Physics of Solids and High Pressures.
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

Descriptors: (*Hyperfine structure, Hydrostatic pressure), (*Hydrostatic pressure, Crystals).

BNL-9167 Field 7D, 20M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE FREE ENERGY OF FORMATION OF THORIUM BORIDES FROM MEASUREMENTS ON SOLID EMF CELLS,
From IAEA Symposium on Thermodynamics, Vienna,
by S. Aronson and A. Auskern. 1964, 10p
CONF-650704-1
Contract AT-30-2-GEN-16

Unclassified report

Descriptors: (*Thermodynamics, Thorium compounds), (*Thorium compounds, Borides).

BNWL-SA-3 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
STATISTICAL CONTROL OF MEASUREMENT QUALITY,
by C. A. Bennett. Jun 65, 20p CONF-650803-1
Contract AT(45-1)-1830

Unclassified report

Prepared from IAEA Symposium on Nuclear Materials Management, Vienna.

Descriptors: (*Statistical analysis, Chemical analysis), (*Quality control, Measurement).

C13.46-270-1 Field 7D, 20M
CFSTI Price: MF$1.00

National Bureau of Standards, Washington, D. C.
Inst. for Materials Research.
SELECTED VALUES OF CHEMICAL THERMODYNAMIC PROPERTIES. PART I. TABLES FOR THE FIRST TWENTY-THREE ELEMENTS IN THE STANDARD ORDER OF ARRANGEMENT.
Technical note,
by D. D. Wagman, W. H. Evans, I. Halow, V. B. Parker, and S. M. Bailey. 1 Oct 65, 129p Rept. no. TN-270-1

Unclassified report

Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.65.

Descriptors: (*Chemistry, Thermodynamics), (*Thermodynamics, Tables), Heat of formation, Entropy, Enthalpy, Chemical compounds.

The tables contain values where known of the enthalpy and Gibbs energy of formation, enthalpy, entropy and heat capacity at 298.15K (25C), and the enthalpy of formation at 0K, for all inorganic substances and organic molecules containing not more than two carbon atoms. In some instances, such as metal-organic compounds, data are given for substances in which each organic radical contains one or two carbon atoms. No values are given in these tables for metal alloys or other solid solutions, fused salts, or for substances of undefined chemical composition. (Author)

C13.46-271 Field 7D, 7A
CFSTI Price: MF$0.75

National Bureau of Standards, Washington, D. C.
Electrochemical Analysis Section.
ELECTROCHEMICAL ANALYSIS: STUDIES OF ACIDS, BASES, AND SALTS BY EMF CONDUCTANCE, OPTICAL AND KINETIC METHODS, JULY 1964 TO JUNE 1965.
Technical note,
ed. by Roger G. Bates. 6 Sep 65, 117p
Rept. no. TN-271

Unclassified report

Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Chemical analysis, Electrochemistry), (*Electrochemistry, Chemical analysis), Acids, Bases(Chemistry), Salts, Conductance, Voltage, Optical properties, Test methods.

This survey of the activities of the Electrochemical Analysis Section, Analytical Chemistry Division of NBS and covers the period July 1964 to June 1965. A description of facilities and equipment is presented first and is followed by brief summaries of the several lines of work currently under way. Emphasis is given to the reasons why each study was undertaken. The main areas of investigation include the study of acidity and solvent effects in water, deuterium oxide, and water-methanol solvents by emf methods; the development of reference indicator bases for nonaqueous media and reference materials for dielectric measurements; measurement of the thermodynamic properties of mixed salt solutions; and investigation of special problems in trace analysis by conductometric and kinetic methods.

C13.46-273 Field 7D, 7B, 7C
CFSTI Price: MF$0.75

National Bureau of Standards, Washington, D. C.
Analysis and Purification Section.
ANALYSIS AND PURIFICATION SECTION: SUMMARY OF ACTIVITIES JULY 1964 TO JUNE 1965.
Technical note,
ed. by John K. Taylor. 1 Oct 65, 85p
Rept. no. TN-273

Unclassified report

Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.

Descriptors: (*Materials, Scientific research), (*Chemical analysis, Scientific research), (*Purification, Chemicals), Mass spectroscopy, Polarographic analysis, Electrochemistry, Microanalysis, Phase studies, Distillation, Reports.

This report describes the scientific programs and research activities of the Analysis and Purification Section of the Analytical Chemistry Division of the NBS Institute for Materials Research. Analytical research areas include: gas analysis by mass spectrometry, polarography, coulometry, microchemistry, stoichiometry, and cryoscopy. Research in methods of

purification is concerned with distillation, high-temperature phase separations, and the ultra purification of chemical reagents. The facilities and general objectives of all programs are discussed. Research accomplishments described in some detail include: modification of mass spectrometer inlet systems to facilitate analytical sampling, polarographic analysis of lead alloys, coulometric calibration of microvolumetric apparatus, precise analysis of copper in small samples, development of apparatus for the purification of inorganic fluorides by high-temperature phase separations, and development of an adiabatic calorimeter for determination of purity of volatile substances. (Author)

CEND-529 Field 7E, 7B
CFSTI Prices: HC$5.00 MF$1.25

Combustion Engineering, Inc., Windsor, Conn. Nuclear Div.
INVESTIGATION OF CATALYTIC RECOMBINATION OF RADIOLYTIC OXYGEN AND HYDROGEN.
Final rept,
by C. Thomas Sawyer and F. M. Stern. 1 Mar 65, 183p EURAEC-1385
Contract AT(40-1)-3151
Unclassified report

Descriptors: (*Oxygen, Recombination reactions), (*Hydrogen, Recombination reactions), (*Recombination reactions, Catalysis).

COO-1088-12 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Northwestern Univ., Evanston, Ill. Dept. of Chemistry.
THE RADIATION CHEMISTRY OF HIGH POLYMERS.
Technical rept. no. 10, 1 Apr 64-1 Apr 65,
by Malcolm Dole. 1 May 65, 22p Unclassified report
Contract AT(11-1)-1088
Descriptors: (*Polymers, Radiation chemistry), (*Radiation chemistry, Polymers).

COO-1148-96 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Michigan Univ., Ann Arbor.
POLAROGRAPHIC REDUCTION OF HYDROGEN ION IN NONAQUEOUS SOLVENTS,
by Philip J. Elving and Michael S. Spritzer.
1965, 32p Unclassified report
Contract AT(11-1)-1148
Descriptors: (*Hydrogen, Reduction(Chemistry)).

N65-22550 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Univ. of Western Ontario, London. Dept. of Physics.
IDENTIFICATION ATLAS OF MOLECULAR SPECTRA I: THE AIO A SQ Σ - CHI-SQ Σ BLUE-GREEN SYSTEM,
by D. C. Tyte and R. W. Nicholls. 10 Mar 64, 15p
Grants NsG-349; AF-AFOSR-62-236A
NASA CR-62398
Unclassified report

Descriptors: (*Molecular spectroscopy, Vibration).

N65-24897 Field 7A, 11B
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
FABRICATION OF HIGH-PURITY POLYCRYSTALLINE MgO,
by Martin H. Leipold and Thomas H. Nielsen.
15 May 65, 11p JPL-TR-32-736
Contract NAS7 100
NASA CR-62973
Unclassified report

Descriptors: (*Magnesium compounds, Oxides), (*Oxides, Synthesis(Chemistry)).

NAA-SR-MEMO-10509 Field 7E, 18G, 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
RADIOCHEMICAL TECHNIQUES IN FISSION GAS MOBILITY STUDIES OF HYDRIDE SYSTEMS,
by A. J. Moses. 29 Sep 64, 12p CONF-721-14
Contract AT-11-1-GEN-8
Unclassified report

Presented at the Conference on Analytical Chemistry in Nuclear Technology, (8th) Gatlinburg, Tenn., Oct 1964.

Descriptors: (*Fission products, Radiochemistry), (*Hydrides, Fission products).

NYO-1018-3 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Rutgers-The State Univ. of New Jersey, New Brunswick.
POLAR-NONPOLAR OR AMPHIPATHIC INORGANIC COMPOUNDS. FINAL REPORT,
by Ulrich P. Strauss. 30 Apr 65, 6p
Contract AT(30-1)-1018
Unclassified report

Descriptors: (*Inorganic polymers, Chemical properties), (*Phosphates, Inorganic polymers).

ORNL-P-1237 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
RADIOACTIVATION ANALYSIS AS AN ANALYTICAL TOOL,
by W. S. Lyon. 1965, 25p CONF-650521-1
Contract W-7405-eng-26
Unclassified report

Presented at the Conference on Purification of Materials, New York.

Descriptors: (*Radioactivation analysis, Neutron activation).

ORNL-TM-1094 Field 7E, 18G, 18J, 7A
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
CHEMICAL TECHNOLOGY DIVISION, UNIT OPERATIONS SECTION.
Monthly progress rept., for Feb 65,
by M. E. Whatley, P. A. Hess, R. W. Horton, A. D. Ryon, and C. D. Watson. May 65, 30p
Contract W-7405-eng-26
Unclassified report

See also ORNL-TM-1092.

Descriptors: (*Fission products, Separation), (*Reactor fuel processing, Combustion), (*Radioactive waste, Processing).

ORNL-TM-1129 Field 7B, 7D
CFSTI Prices: HC$5.00 MF$1.00

Oak Ridge National Lab., Tenn.
OXIDE CHEMISTRY AND THERMODYNAMICS OF MOLTEN LITHIUM FLUORIDE-BERYLLIUM FLUORIDE BY EQUILIBRATION WITH GASEOUS WATER-HYDROGEN FLUORIDE MIXTURES.
Doctoral thesis,
by A. L. Mathews and C. F. Bees, Jr. 7 May 65, 187p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Lithium compounds, Fluorides), (*Beryllium compounds, Fluorides).

Patent 3,209,008 Field 7D, 15B

PREPARATION OF AROMATIC GLYOXYLONITRILE OXIMES.
Patent assigned to Army,
by Edward J. Poziomek and Arthur R. Melvin.
28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Oximes, Synthesis(Chemistry)), (*Nitriles, Synthesis(Chemistry)), (*Pyridines, Oximes), Aromatic compounds, Aldehydes, Chlorine, Organic solvents, Alcohols, Potassium compounds, Cyanides, Chemical precipitation, Chemical warfare agents, Detection, Colometric analysis, Patents.

The compounds are useful intermediates to make colorimetric detector chemicals. Heterocyclic and aromatic acetonitrile oximes are prepared from aldoximes which are commercially available. The process involves the cyanization of aldoximes. A specific embodyment is the preparation of 4-pyridine glyoxylonitrile oxime from isonicotinaldehyde in methanol and in the presence of potassium cyanide.

RPI-321-1 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y. Mason Lab.
BASIC RADIATION CHEMISTRY,
Progress rept. for 1 Oct 63-30 Sep 64,
by S. Dondes. 29 Jan 65, 11p
Contract AT(30-3)-321
Unclassified report

Descriptors: (*Radiation chemistry, Reviews).

RPI-321-2 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y. Mason Lab.
RADIATION CHEMISTRY.
Progress rept. for 1 Nov-31 Dec 64,
by S. Dondes. 29 Jan 65, 6p
Contract AT(30-3)-321 Task 1
Unclassified report

Descriptors: (*Radiation chemistry, Reports), Ozone, Decomposition, Infrared spectroscopy, Carbon compounds, Oxides, Polymerization.

SRIA-121 Field 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.
THE Bi I3-I2 PHASE DIAGRAM.
Technical rept.,
by Ferenc E. Rosztoczy and Daniel Cubicciotti.
2 Jun 64, 14p Rept. no. TR-25
Contract AT(04-3)-106, Proj. SRI SV1827
Unclassified report

Descriptors: (*Bismuth compounds, Iodides), (*Phase studies, Iodine compounds), Iodine.

TID-20853 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.
LOW-TEMPERATURE CHEMISORPTION OF GASES ON CLEAN METAL SURFACES,
by R. A. Pasternak, N. Endow, A. P. Brady, and B. Bergsnov-Hansen. 1963, 15p
Contract AT(04-3)-115
Unclassified report

Descriptors: (*Chemisorption, Gases), (*Methods, Chemisorption).

TID-20866 Field 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
CHRONOPOTENTIOMETRY IN FUSED NITRATES. PART I, SILVER NITRATE - SODIUM NITRATE,
by Kazutaka Kawamura. 1963, 15p
Contract AT(30-1)-2644
Unclassified report

Descriptors: (*Nitrates, Transport properties).

TID-21388 Field 7E, 7C
CFSTI Prices: HC$4.00 MF$0.75

Vanderbilt Univ., Nashville. Graduate School.
IRRADIATION OF HALOGENATED ALKENES: REACTION PRODUCTS AND MOLECULAR WEIGHT DISTRIBUTIONS.
Master's thesis,
by Harry L. Cornish, Jr. May 64, 127p
Unclassified report

Submitted to Vanderbilt Univ., Nashville. Graduate School.

Descriptors: (*Halogenated hydrocarbons, Radiation chemistry), (*Alkenes, Radiation chemistry).

TID-21389 Field 7E, 7C
CFSTI Prices: HC$3.00 MF$0.75

Vanderbilt Univ., Nashville. Graduate School.
THE EFFECTS OF IONIZING RADIATION ON PHENYL ACETYLENE, ETHYL ACETYLENE, 2,3-DICHLOROPROPENE, AND ETHYLENE.
Master's thesis,
by Lawrence William Utley, Jr. Jan 64, 80p
Unclassified report

Submitted to Vanderbilt Univ., Nashville. Graduate School.

Descriptors: (*Hydrocarbons, Radiation chemistry).

TID-21411 Field 7A, 7E, 18J
CFSTI Prices: HC$2.00 MF$0.50

Vienna Univ. (Austria). Analytishches Institut.

ION EXCHANGE SEPARATION OF URANIUM AND THORIUM IN NON-AQUEOUS AND MIXED MEDIA.
Progress rept. for May - Oct 64,
by Johann Korkisch. Oct 64, 40p
Contract AT(30-1)-2623

Unclassified report

Descriptors: (*Uranium, Ion exchange), (*Thorium, Ion exchange).

TID-21525 Field 7E, 20H
CFSTI Prices: HC$3.00 MF$0.75

Wherrett Lab. of Nuclear Chemistry, Pittsburgh Univ., Pa.
NUCLEAR CHEMISTRY RESEARCH. A. CHARGE STATES OF CARBON AND BORON RECOILS. B. ISOMERIC YIELD RATIOS. C. EXCITATION FUNCTIONS. D. DENSITOMETRIC DETERMINATION OF CONVERSION ELECTRON LINE INTENSITIES.
Annual rept. for Jan 64-Jan 65,
by Robert L. Wolke. Jan 65, 59p
Contract AT(30-1)-2771

Unclassified report

Descriptors: (*Recoil atoms, Electrostatics), (*Deuteron reactions, Recoil atoms), (*Atomic energy levels, Excitation), (*Line spectrum, Intensity).

TID-21662 Field 7C, 7E, 18B
CFSTI Prices: HC$1.00 MF$0.50

Arkansas Univ., Fayetteville. Dept. of Chemistry.
TRACER AND ISOTOPE EFFECT STUDIES IN ORGANIC CHEMISTRY.
Annual Progress rept.,
by Arthur Fry. 15 Jan 65, 24p
Contract AT(40-1)-3234

Unclassified report

Descriptors: (*Tracer studies, Organic compounds), (*Isotopes, Organic compounds).

TID-21840 Field 7D, 7B
CFSTI Prices: HC$4.00 MF$0.75

Delaware Univ., Newark. Dept. of Chemical Engineering.
THE SECOND-ORDER THEORY OF CONFORMAL SOLUTIONS USING THE MORSE POTENTIAL FUNCTION.
Doctoral thesis,
by Osamu Yoshikawa. 22 Aug 64, 143p
Contract AT(30-1)-2722

Unclassified report

Descriptors: (*Equations of state, Potential theory), (*Statistical analysis, Thermodynamics).

TID-21866 Field 7D, 7C
CFSTI Prices: HC$1.00 MF$0.50

South Carolina Univ., Columbia. Dept. of Chemistry.
THE DETERMINATION OF THE IONIZATION CONSTANTS OF SOME SULFONIC ACIDS BY RAMAN MEASUREMENTS,
by O. D. Bonner and Arnold L. Torres. 1962, 10p
Contract AT(40-1)-1437

Unclassified report

Descriptors: (*Sulfonates, Ionization), (*Raman spectroscopy, Sulfonates).

UCRL-7759-T Field 7A
CFSTI Prices: HC$2.00 MF$0.50

California Univ., Berkeley. Dept. of Chemical Engineering.
MIXING AND CHEMICAL REACTION IN TURBULENT FLOW REACTORS,
by R. Norris Keller, E. E. Petersen, and John M. Prausnitz. 1964, 29p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Turbulence, Chemical reactions), (*Chemical reactions, Turbulence).

UCRL-7907 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
CORRESPONDING STATES AT SMALL INTERATOMIC DISTANCES,
by R. Norris Keeler, Marvin Ross, Mathias Van Thiel, and Berni J. Adler. 26 Jun 64, 8p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Molecular properties, Potential theory), (*Potential theory, Molecules).

UCRL-7910 Field 7D, 8G
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
SOLID-STATE REACTION KINETICS BY NON-ISOTHERMAL METHODS. I. THERMOGRAVIMETRIC AND DIFFERENTIAL THERMAL ANALYSIS STUDIES OF THE THERMAL DISSOCIATION OF POLYHALITE,
by T. D. George, W. W. Wendlandt, and M. W. Nathans. 10 Jun 64, 23p
Contract W-7405-eng-48

Unclassified report

Prepared in cooperation with Texas Technological Coll., Lubbock. Dept. of Chemistry.

Descriptors: (*Sulfates, Dissociation), (*Pyrolysis, Reaction kinetics), (*Reaction kinetics, Solids).

UCRL-12260-T Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE VAPOR PRESSURE OF TECHNETIUM,
by Oscar H. Krikorian, John N. Carpenter, and Ray S. Newbury. 14 Dec 64, 7p CONF-650401-3
Contract W-7405-eng-48

Unclassified report

Presented at the American Chemical Society, Detroit.

Descriptors: (*Vapor pressure, Technetium), (*Technetium, Vapor pressure).

UCRL-16021 Field 7C, 7D
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
OXYGEN INITIATED PYROLYSIS OF ETHYLBENZENE,
by Edwin D. Hausmann and C. Judson King.
29 Mar 65, 57p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Aromatic compounds, Pyrolysis), (*Pyrolysis, Catalysis).

USNRDL-TR-823 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Naval Radiological Defense Lab., San Francisco, Calif

DEVELOPMENT OF A HIGH-TEMPERATURE ISOPIESTIC TECHNIQUE. EQUILIBRATION OF VAPOR FROM RUBIDIUM AND MOLYBDENUM OXIDES WITH VARIOUS NON-VOLATILE OXIDES,
by C. E. Adams and J. T. Quan. 19 Jan 65, 41p
Contract AT(49-7)-1963

Unclassified report

Descriptors: (*Rubidium compounds, Vapors), (*Molybdenum compounds, Vapors), Oxides.

USNRDL-TR-831 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Naval Radiological Defense Lab., San Francisco, Calif.
A RAPID IODINE RADIOCHEMICAL PROCEDURE,
by A. E. Greendale, D. L. Love, and A. A. Delucchi.
12 Feb 65, 25p
Contract AT(49-2)-1167

Unclassified report

Descriptors: (*Iodine, Fission products), (*Radiochemistry, Iodine).

Y-1481 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
SPARK-SOURCE MASS SPECTROMETRIC ANALYSIS OF COMMON AND RADIOGENIC LEAD,
by J. C. Franklin and E. B. Griffin. 25 Feb 65, 10p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Lead, Mass spectroscopy), (*Mass spectroscopy, Lead).

08. Earth Sciences and Oceanography

CU-2663-20 Field 8C
CFSTI Prices: HC$3.00 MF$0.75

Lamont Geological Observatory, Palisades, N. Y.
DYNAMICS OF GULF STREAM MEANDERS,
by Takashi Ichiya. Apr 65, 92p
CU-1806-3, CU-266-48-13 Unclassified report
Contract AT(30-1)-2663

Descriptors: (*Gulf stream, Configuration), (*Oceanology, Gulf stream).

N65-21388 Field 8G, 3A
CFSTI Prices: HC$3.00 MF$0.75

Bern Univ. (Switzerland). Physikalisches Institut.
RARE GAS MEASUREMENTS IN METEORITES AND POSSIBLE APPLICATIONS TO THE LUNAR SURFACE,
by Peter Eberhardt. Jun 64, 75p
Grant NsG-157
NASA CR-62101

Unclassified report

Descriptors: (*Meteorites, Helium group gases), (*Helium group gases, Meteorites).

N65-25589 Field 8E
CFSTI Prices: HC$4.00 MF$0.75

Princeton Univ., N. J. Dept. of Geology.
A VISCOUS MODEL OF THE EARTH COMPARED TO GRAVITY ANOMALIES AND SEISMIC REFRACTION PROFILES OF OCEANIC TRENCHES AND RIDGES,
by W. Jason Morgan. 30 Apr 65, 79p Rept. no. 2
Grants NsG556, NSF GP1450
NASA CR-63244

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Geodesics, Earth models), (*Earth models, Geodesics).

09. Electronics and Electrical Engineering

AD-403 783 Field 9A, 11B, 20B
CFSTI Price: HC$3.00

Linden Labs., Inc., State College, Pa.
CRYSTAL CHEMISTRY OF CERAMIC DIELECTRICS.
Quarterly rept. no. 1, 15 Nov 62-15 Feb 63,
by W. R. Buessem and P. A. Marshall, Jr.
15 Mar 63, 67p Rept. no. 17
Contract DA36 039AMC00107E

Unclassified report

Available copy will not permit fully legible reproduction. Continuation of Contract DA36 039sc78912. See also AD-412 964.

Descriptors: (*Ceramic material, Dielectrics), (*Dielectrics, Ceramic materials), (*Barium compounds, Titanates), Ceramic capacitors, Voltage, Stresses, Electrical properties, Ferroelectric crystals, Degradation, Hydrogenation, Crystal lattices, Stability, Dielectric properties, Capacitors.

An investigation is made of the potential distribution in a BaTiO3 dielectric under DC-stress and its changes with time. The new measurements which have been performed in dry atmosphere differ markedly from former measurements in humid atmosphere, the other experimental conditions being equal. After degradation had progressed for some time the sample was given rest periods of different lengths after which very strong local fields appeared at the cathode as well as at the anode. It is thought that these fields are connected with the current spikes which had been observed in life tests after similar rest periods. The question of whether the proton can enter the titanate lattice is discussed and some new evidence is presented. A stability study of hot pressed BaTiO3 dielectrics is presented.

AD-412 964 Field 9A, 11B, 20B
CFSTI Price: HC$3.00

Linden Labs., Inc., State College, Pa.
CRYSTAL CHEMISTRY OF CERAMIC DIELECTRICS.
Quarterly rept. no. 2, 15 Feb-15 May 63,
by W. R. Buessem and P. A. Marshall, Jr.
15 Jun 63, 66p Rept. no. 18
Contract DA36 039AMC00107E

Unclassified report

Available copy will not permit fully legible reproduction. Continuation of Contract DA36 039sc78912. See also AD-423 530.

Descriptors: (*Ceramic materials, Dielectrics), (*Dielectrics, Ceramic materials), (*Barium compounds, Titanates), (*Ceramic capacitors, Degradation), Dielectrics properties, Degradation, Ferroelectric crystals, Heat treatment, Voltage, Electric currents, Electric discharges, Electrodes, Capacitance, Crystal lattices.

The present report contains three parts. The first part is concerned with the effect of the electrode material on the degradation rate of BaTiO3 dielectrics. Studied were gold, silver, indium-gallium and graphite in all combinations as cathode and anode. The results indicate that only the material at the anode determines the rate of degradation. Silver at the anode enhances degradation, gold slows it down and indium-gallium has an intermediate effect. Graphite at the anode gives first rise to a strong current increase, almost like silver. The second part of the report deals with new measurements of potential distribution changes during degradation in BaTiO3 dielectrics. The third part of the report represents a discussion of selected measurements on the charge-discharge phenomenon in stable commercial bodies as received and after reducing pretreatments. These results confirm that the discharge currents measured at a fixed time are not a monotonic function of the state of degradation or reduction, but go through a maximum. (Author)

AD-423 530 Field 9A, 11B, 20B
CFSTI Price: HC$3.00

Linden Labs., Inc., State College, Pa.
CRYSTAL CHEMISTRY OF CERAMIC DIELECTRICS.
Quarterly rept. no. 3, 15 May-15 Aug 63,
by W. R. Buessem and P. A. Marshall, Jr.
15 Sep 63, 84p Rept. no. 19
Contract DA36 039AMC00107E
Unclassified report

Available copy will not permit fully legible reproduction.
Continuation of Contract DA36 039sc78912.

Descriptors: (*Ceramic materials, Dielectrics), (*Dielectrics, Ceramic materials), (*Ceramic capacitors, Electrical properties), (*Barium compounds, Titanates), Degradation, Ferroelectric crystals, Voltage, Electrodes, Crystal lattice defects, Dielectric properties, Stresses, Spaces charges.

This report contains new measurements of distributions and their changes with time under DC-stress. The cases investigated were BaTiO3-dielectrics with graphite electrodes on cathode and anode; graphite electrodes on anode and indium-gallium on cathode; graphite electrodes on cathode and indium-gallium on anode. The two cases with graphite at the anode show a resistivity increase after an initial strong decrease. The potential distributions in these two cases are similar and characteristically different from the case with graphite at the cathode. The other series investigated were BaTiO3-dielectrics having a UO3-containing layer either at the cathode, at the anode or on both sides. (Author)

AI-MEMO-9201 (rev 1) Field 9B, 18I
CFSTI Prices: HC$4.00 MF$1.50

Atomics International, Canoga Park, Calif.
ABSTRACTS OF AVAILABLE CODES AT ATOMICS INTERNATIONAL,
by R. A. Blaine. Apr 64, 149p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear reactors, Programming(Computers)), (*Programming(Computers), Nuclear reactors).

N65-15367 Field 9A
CFSTI Prices: HC$1.00 MF$0.50

Texas Univ., Dallas. Southwestern Medical School.
TECHNICAL EVALUATION OF A ONE-INCH MINIATURIZED VIDICON IN COMBINATION WITH A MINIATURIZED PHASE MICROSCOPE,
Semiannual status rept., 1 Oct 62-31 Mar 63,
by P. O. Montgomery. 1963, 5p
NSG210 62 Unclassified report
NASA CR-50262

Descriptors: (*Vidicons, Miniature electron tubes), (*Microscopes, Vidicons).

N65-17284 Field 9F
CFSTI Prices: HC$1.00 MF$0.50

TRW Space Technology Labs., Inc., Los Angeles, Calif. Data Analysis Dept.
PROCESSING AND PRESENTATION OF DIGITAL DATA FROM OUTER SPACE. II- EXPLORER VI 'PADDLEWHEEL' SATELLITE,
by K. H. Redner, D. W. Roberts and J. M. Seehof.
1963, 16p
NASA CR-51035
Unclassified report

Descriptors: (*Telemetering data, Processing), (*Digital systems, Telemetering data).

N65-17607 Field 9A, 3B, 22-
CFSTI Prices: HC$2.00 MF$0.50

TRW Space Technology Labs., Inc., Redondo Beach, Calif. Space Physics Dept.
DEVELOPMENT OF A LUMINESCENT CHAMBER FOR SPACE RESEARCH,
Final rept.,
by R. F. Doolittle. 30 Sep 63, 39p
Rept. no. STL-9803-6005-RU-000
Contract NASW-285 Unclassified report
NASA CR-60900

Descriptors: (*Image intensifiers(Electronics), Spacecraft), (*Spacecraft, Image intensifiers(Electronics)), Luminescence, Scintillation counters, Balloons, Charged particles, Mesons.

N65-17955 Field 9E, 17B
CFSTI Prices: HC$5.00 MF$1.25

Space Craft, Inc., Huntsville, Ala.
AROD TRANSPONDER,
Final engineering rept.
Jun 64, 183p
Contract NAS8 5480 Unclassified report
NASA CR-59012

Descriptors: (*Transponders, Design).

N65-19767 Field 9E
CFSTI Prices: HC$1.00 MF$0.50

New York Univ., N. Y. Lab. for Electroscience Research.
WIDE BAND PHASE DISTORTION EQUALIZATION.
Technical memo.,
by C. Capetanopoulos. Jul 64, 15p
Rept. no. TM-41
Contract NAS5 3508 Unclassified report
NASA CR-57314
Microfilmed from best available copy.

Descriptors: (*Phase distortion, Broadband), (*Broadband, Phase distortion).

N65-19926 Field 9A
CFSTI Prices: HC$4.00 MF$1.00

International Business Machines Corp., Hopewell Junction, N. Y. Components Div.
INTEGRATED ELECTRONIC GATING SYSTEM FOR MULTIPLEXING APPLICATIONS.
Final rept. for 17 Apr 63-15 Nov 64.
15 Dec 64, 138p
Contract NAS7 100
NASA CR-57516

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Gates(Circuits), Integrated circuits), (*Multiplex, Gates(Circuits)).

N65-21382 Field 9B
CFSTI Prices: HC$5.00 MF$1.00

Case Inst. of Tech., Cleveland, Ohio. Digital Systems Lab.
A DIGITAL CONTROLLER EMPLOYING TRUNCATED LOGARITHMIC QUANTIZATION,
by John B. Peatman. Aug 64, 154p EDC-1-64-28
Grant NsG 36-60
NASA CR-57858

Unclassified report

Descriptors: (*Digital computers, Computer logic), (*Computer logic, Control systems).

N65-22656 Field 9E
CFSTI Prices: HC$2.00 MF$0.50

Honeywell, Inc., Hopkins, Minn. Ordnance Div.
LOW VOLTAGE DC TO DC CONVERTER-REGULATOR WITH MINIMUM EXTERNAL MAGNETIC FIELD DISTRUBANCE.
Quarterly progress rept. no. 3, 1 Dec 64-28 Feb 65,
by Kenneth J. Jenson and John T. Lingle. 1965, 55p
Contract NAS5 3899
NASA CR-62445

Unclassified report

Descriptors: (*Voltage regulators, Magnetic fields), (*Coils, Voltage regulators).

N65-23063 Field 9E
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Pittsfield, Mass. Ordnance Dept.
DIRECT CURRENT TORQUE AMPLIFIER FOR DRIVING A GYRO-STABILIZED PLATFORM.
Final rept.,
by H. L. Broverman. 12 Jun 64, 29p FDU-64-7
Contract NAS8-5421
NASA CR-62469

Unclassified report

Descriptors: (*Servomechanisms, Stabilized platforms), (*Stabilized platforms, Servomechanisms).

N65-23280 Field 9F, 22B
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
APPLICATION OF THE STATISTICAL THEORY OF EXTREME VALUES TO SPACECRAFT RECEIVERS,
by John C. Ashlock and Edward C. Posner.
15 May 65, 13p JPL-TR-32-737
Contract NAS7 100
NASA CR-62638

Unclassified report

Descriptors: (*Spacecraft, Transmitter-Receivers), (*Transmitter-Receivers, Statistical analysis), Errors, Monitors.

N65-24980 Field 9B, 9A
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Newbury Park, Calif. Astroelectronics Dept.
MOLECULAR POWER SUPPLY.
Quarterly rept. no. 3, Nov-31 Jan 63.
31 Jan 63, 20p
Contract NAS7 100
NASA CR-63114

Unclassified report

Descriptors: (*Power supplies, Molecular electronics), (*Computer logic, Molecular electronics).

N65-24991 Field 9F, 17B
CFSTI Prices: HC$6.00 MF$1.25

Electronic Communications, Inc., Timonium, Md. Research Div.
INVESTIGATION AND STUDY OF A MULTI-APERTURE ANTENNA SYSTEM.
Final rept. for 1 Jan-1 Apr 64.
1 Apr 64, 212p
Contract NAS5 3472
NASA CR-63082

Unclassified report

Descriptors: (*Telemetering antennas, Space communication systems), (*Space communication systems, Telemetering antennas).

N65-25451 Field 9B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, New York. Goddard Inst. for Space Studies.
SUPERSPEED COMPUTERS: A MAJOR TOOL IN THE SPACE SCIENCES,
by Robert Jastrow and Albert Arking. 23 May 65,
11p
NASA TMX-56433

Unclassified report

Pub. in New York Times Supplement May 23 1965.

Descriptors: (*Computers, Scientific research).

N65-25999 Field 9E
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PHASE ERROR AND ASSOCIATED CROSS-POLARIZATION EFFECTS IN CASSEGRAINIAN-FED MICROWAVE ANTENNAS.
Technical rept.,
by W. V. T. Rusch. 30 May 64, 27p
Rept. no. JPL-TR-32-610
NASA CR-63343

Unclassified report

Descriptors: (*Parabolic antennas, Phase measurement), (*Microwave equipment, Polarization).

N65-26417 Field 9A, 20F
CFSTI Prices: HC$1.00 MF$0.50

ITT Industrial Labs., Fort Wayne, Ind.

RESEARCH IN THE DEVELOPMENT EFFORT OF AN IMPROVED MULTIPLIER PHOTOTUBE.
Quarterly rept. no. 3,
by E. H. Eberhardt. 28 May 65, 24p
Contract NASW1038
NASA CR-63400

Unclassified report

Descriptors: (*Photomultipliers, Feasibility studies), (*Electron optics, Photomultipliers).

N65-27398 Field 9A, 20N
CFSTI Prices: HC$2.00 MF$0.50

Gordon McKay Lab. of Applied Science, Harvard Univ., Cambridge, Mass.
EXPERIMENTAL STUDIES OF THE TRAVELING-WAVE V-ANTENNA AND RELATED ANTENNAS,
by Keigo Iizuka. Jul 65, 44p
Grant NsG579
NASA CR-260

Unclassified report

Descriptors: (*Antennas, Antenna radiation patterns), (*Electromagnetic waves, Antenna radiation patterns).

ORNL-TM-998 Field 9A
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
A SENSITIVE TUNNEL DIODE DISCRIMINATOR,
by N. W. Hill. 12 Jan 65, 5p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Discriminators, Tunnel diodes), (*Tunnel diodes, Discriminators).

ORNL-TM-1055 Field 9A, 18D
CFSTI Prices: HC$6.00 MF$1.25

Oak Ridge National Lab., Tenn.
OPTIMIZATION OF SEMICONDUCTOR PREAMPLIFIERS FOR USE WITH SEMICONDUCTOR RADIATION DETECTORS,
Doctoral thesis,
by Theron Vaughn Blalock. 23 Feb 65, 252p
Contract W-7405-eng-26

Unclassified report

Submitted to Univ. of Tennessee.

Descriptors: (*Preamplifiers, Semiconductor devices), (*Radiation measurement systems, Preamplifiers), Transistors.

Patent 3,202,999 Field 9B

ELECTRONIC CONVERTER AND PRINTER.
Patent assigned to Navy,
by George J. Moss, Jr. 24 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Digital-to-analog converters, Digital recording systems), Printing, Control sequences, Computer logic, Switching circuits, Patents.

Logical switching circuitry is provided for converting the contents of an electronic counter, storing a number in the binary notation, and printing out the contents of the counter in Arabic notation. The recorder has a serieal counter, for counting elapsed time, and logical converter circuitry for transforming the count into the Arabic numeral format for electrical printing by the recorder.

Patent 3,205,454 Field 9E, 9A

RANDOM AMPLITUDE SAMPLING CIRCUIT.
Patent assigned to Navy,
by William W. Lowe. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Wave form generators, Circuits), (*Circuits, Waveform generators), Oscillators, Switching circuits, Probability, Patents.

The apparatus is for producing randomly variable amplitude signals having a Gaussian probability distribution. The circuit includes a waveform generator, a sample and hold circuit, a sample rate oscillator and an amplitude transfer circuit.

Patent 3,206,612 Field 9E, 9A

SIGNAL TIME COMPARISON CIRCUIT UTILIZING UJT CHARACTERISTICS.
Patent assigned to Navy,
by James E. Swanekamp and Robert R. Wilson.
14 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Time-delay relays, Circuits), (*Transistors, Time-delay relays), Integrated circuits, Diodes(Semiconductor), Switching circuits, Power supplies, Patents.

The circuit is utilized to produce an impulse a predetermined time after the circuit has been energized. The circuit has an integrator which is charged by the power supply of the system. The output of the integrator circuit is coupled to the emitter of a double base diode which is normally conducting little or no base to base current. When the integrator output reaches a predetermined value the double base diode is energized producing a pulse which is supplied to a semiconductor switching network. The switching circuit comprises either a silicon controlled rectifier or a Shockley diode. The input ot the integrator circuit may be supplied either through an impedance coupled to the controlled rectifier or directly from the circuit power supply.

Patent 3,209,154 Field 9A, 10A, 20L, 20F

LIGHT RESPONSIVE SYSTEM INCLUDING LOAD CIRCUIT WITH SOLID STATE SWITCH.
Patent assigned to FAA,
by Robert J. Maring. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Light, Energy conversion), (*Photoelectric cells(Semiconductor), Circuits), (*Signal generators, Photoelectric cells(Semiconductors)), Solid state physics, Electronic switches, Electrical engineering, Patents.

The light responsive system includes the combination of a light responsive photocell circuit and a solid-state controlled load circuit responsive to the signal generated by the photocell circuit. The photocell circuit and the load circuit have a solid state switch directly connected to the photocell without any intervening amplifying components.

Patent 3,209,246 Field 9C, 14B

MEANS FOR CALIBRATING THE SENSITIVITY OF RESPONSE OF A CONDITION-RESPONSIVE CIRCUIT COMPONENT.
Patent assigned to Navy,
by Donald G. Siefert. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Transducers, Calibration), (*Calibration, Transducers), (*Test equipment-(Electronics), Transducers), Measuring devices-(Electrical + Electronic), Servomechanisms, Patents.

The apparatus may be used in calibrating instruments used for the measurement of temperature, humidity, electrical resistance or a transducer which may be a strain gauge having four arms arranged in the form of a balanced bridge and useful in testing certain characteristics of a guided missile. Apparatus is provided for storing or retaining information during successive testing operations to thereby yield an output representative of any deviation of a particular element being tested from the level or value established by such stored or retained information.

Patent 3,209,252 Field 9C, 9A, 14B

CATHODE-RAY TUBE FREQUENCY METER HAVING A PAIR OF DEFLECTION MEANS OF UNEQUAL LENGTH.
Patent assigned to Army,
by Raymond C. Cumming. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Frequency meters, Television display systems), (*Cathode ray tubes, Television display systems), (*Television display systems, Frequency meters), Video signals, Deflection, Electron optics, Waveform generators, Patents.

The frequency includes a cathode-ray tube with two pairs of deflection plates. A novel connection of two such deflection-plate pairs, having different lengths, yields a straight-line display whose slope is a function of frequency. The amplitude of the signal affects the length of the straight-line but does not influence its slope. Thus the slope of the straight-line display is a unique function of the frequency of the signal, while its length is a unique function of the amplitude.

Patent 3,209,272 Field 9A

WIDE BAND TRAVELING WAVE TUBE AMPLIFIER APPARATUS.
Patent assigned to Navy,
by John T. Mendel. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Traveling-wave tubes, Broadband), (*Amplifiers, Traveling-wave tubes), Cascade structures, Demodulators, Circuits, Electron guns, Electron optics, Patents.

The traveling wave tube amplifier is associated with a demodulator circuit and to a cascade arrangement of traveling wave tube amplifiers. A travelling wave tube of the general type is used. This conventional structure is modified by the addition of a grid in the electron gun which is spaced from the cathode by a distance which is of the order of one-thousandth of an inch both the emitting surface of the cathode and the grid thus introduced being planar in order to permit spacings of this order of magnitude to be actually realized. With spacings of this order of magnitude the electron beam can be efficiently density-modulated and the original signals applied between cathode and grid. A local oscillator is provided for developing a substantially constant frequency which is several times the highest component frequency in the original signals.

Patent 3,209,276 Field 9A

MICROWAVE CAVITY HAVING PLURAL CAPACITANCE PROBES WHICH ACT AS A MODE SEPARATOR.
Patent assigned to Army,
by Roger H. Fricke and Joseph F. McSparran.
28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Cavity resonators, Microwave equipment), (*Microwave equipment, Cavity resonators), Broadband, Capacitance, Tuning devices, Patents.

The broad-band capacitively-tuned box type cavity resonator gives optimum performance over the entire band of interest with but one tuning control per cavity. This is accomplished by symmetrically placing a plurality of probes around the grid contact ring of the cavity. These probes add additional capacitance across the tube.

Patent 3,209,279 Field 9A, 20A

SEMICONDUCTOR NOISE SOURCE.
Patent assigned to Army,
by George N. Kambouris. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Noise generators, Avalanche diodes), (*Avalanche diodes, Noise generators), (*Semiconductors, Noise generators), Transistors, Noise, Amplifiers, Patents.

The random noise generator has a relatively large output voltage. A diode having a reverse breakdown characteristic, known as an 'avalanche' diode, and which is further characterized by being noisy in the region immediately following its breakdown point, is placed between the base and collector of a transistor so as to permit the current amplification properties of a grounded emitter transistor to amplify the noise voltage to a useful level. The transistor load resistance and supply voltage are adjusted so that the circuit will operate in the region where the diode is in its noisy state.

Patent 3,209,359 Field 9E

SINGLE PLANE SCANNING ANTENNA.
Patent assigned to Navy,
by Alan R. Mace and Jacob Tellier. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Radar antennas, Mechanical scanning), (*Scanning, Radar antennas), (*Radar scanning, Antennas), Patents, Disks, Rotation, Reflectors, Waveguides, Antenna feeds.

Rapid scanning in one plane is achieved by providing a stationary waveguide radiator and a pair of rotating disks that direct energy from the radiator. By providing a discontinuous periphery on the disks, the beam can be scanned in one direction and a very rapid switching time can be obtained.

Patent 3,209,360 Field 9E

ANTENNA BEAM-SHAPING APPARATUS.
Patent assigned to NASA,
by Danver M. Schuster. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Parabolic antennas, Antenna radiation patterns), (*Antenna feeds, Electromagnetic shielding), Patents, Waveguides, Attenuation, Beams(Electromagnetic).

The antenna is of the type having a reflector dish and a wave-guide horn for radiating energy at the reflector dish and for receiving energy therefrom. An arrangement is disclosed whereby a conductive ground plane is positioned around the mouth of the wave-guide for preventing the H-plane component of the undesired power from being radiated into the ground-illumination region. The ground plane is also tilted at an angle in order to effectuate cancellation of the E-plane wave-pattern portion of the undesired radiation.

Patent 3,209,362 Field 9E

LOG-PERIODIC BOW-TIE ANTENNA.
Patent assigned to Army,
by Stanley D. Spiegelman. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Log periodic antennas, Broadband), Patents, Coaxial cables, Antenna feeds, Antenna components, Antenna configurations.

The antenna was developed to fill the requirement for a broadband primary feed for a paraboloidal reflector. A unidirectional, broadband antenna is provided, the phase center of which remains fixed. The arrangement includes two log-periodic antenna elements, in the shape of a 'bow-tie' and fed in parallel against a ground plane. This arrangement does not require a balanced feed and may therefore be fed directly by a coaxial line.

Patent 3,211,840 Field 9A, 20A

ELECTRO-SONIC DELAY LINE.
Patent assigned to Navy,
by Maxime G. Kaufman. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Delay lines, Acoustic equipment), (*Acoustic equipment, Delay lines), Space surveillance systems, Radar reflections, Energy conversion, Transducers, Sound signals, Electronic recording systems, Patents.

The sonic delay line is for use in electronic communication and recording systems. The system involves the use of recorders in the surveillance of space for the detection of satellites. The sonic delay is produced by employing speaker components for converting signals of telephone line frequency into sound which is transmitted through a pipe or conduit long enough to provide the desired delay. The sound waves are then reconverted by a microphone to electrical signals of telephone line frequency and transmitted electrically to the recorders.

Patent 3,211,899 Field 9E, 9A

DELAY LINE APPARATUS.
Patent assigned to Army,
by James S. Shreve. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Delay lines, Waveform generators), Wave analyzers, Circuits, Gates(Circuits), Communication theory, Computer logic, Patents.

The delay line apparatus is for modifying the time axis of time-varying functions in preselected patterns. The system includes a signal input terminal, a trigger pulse terminal, two delay lines, a series of taps and AND gates, and a weighing and summing device.

Patent 3,212,016 Field 9E

AVALANCHE DIODE MICROWAVE DETECTOR.
Patent assigned to Navy,
by Howard M. Day and Alan C. Macpherson.
12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Demodulators, Microwave equipment), (*Avalanche diodes, Demodulators), Patents, Radar equipment, Semiconductor devices, Reliability-(Electronics).

The avalanche diode microwave detector is used in a radar system. This semiconductor device is suitable for use in most high-level non-linear device applications. The device consists of a brass base section, a section of N-type material, N type silicon, bonded to the base and a point contact junction, using a tungsten cats whisker.

Patent 3,212,031 Field 9E

RECIPROCAL MICROWAVE PHASE SHIFTER.
Patent assigned to Army,
by Frank Reggia and Edward G. Spencer.
12 Oct 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Phase shifters, Microwave equipment), Patents, Waveguides, Ferromagnetic materials, Rods, Magnetic fields, Phase shift, X-band.

The phase shifter includes a rectangular waveguide section, a ferrite rod located in the waveguide section and an arrangement for applying a longitudinal magnetic field to the rod. Large phase shifts are applied with small applied magnetic fields.

Patent 3,212,035 Field 9E, 11A

MICROWAVE WAVEGUIDE COUPLING SEAL.
Patent assigned to AEC,
by Knut Skarpass. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Waveguide couplers, Vacuum seals), (*Vacuum seals, Waveguide couplers), Patents, Microwave equipment, Wave transmission, Flanges, Gaskets, Radiofrequency power.

The coupling includes a flanged joint sealed by a gasket and seat arrangement. The combination may be used in systems for transmitting wave power from klystron tubes to accelerator vacuum systems or to radar systems. The coupling seal utilizes a combination flange and gasket configuration wherein the gasket provides an uninterrupted contact surface between the abutting ends of two waveguide sections to facilitate low loss transmission of high-frequency power therethrough.

Patent 3,212,093 Field 9E

CENTER-FED WHIP ANTENNA.
Patent assigned to Army,
by Helmut Brueckmann. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Dipole antennas, Antenna feeds), (*Antenna feeds, Dipole antennas), Patents, Damage, Wave transmission, Ground vehicle antennas.

The center-fed whip antenna continues to radiate energy even after it has been broken below the feedpoint. The antenna is designed particularly for use on military tanks. When the upper radiator is broken off the inner conductor remains exposed to function as the upper radiator.

Patent 3,212,096 Field 9E

PARABOLIC REFLECTOR HORN FEED WITH SPILL-OVER CORRECTION.
Patent assigned to NASA,
by Danver M. Schuster and David L. Nixon.
12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Antenna feeds, Electromagnetic shielding), (*Parabolic antennas, Antenna feeds), Reflectors, Attenuation, Waveguides, Antenna radiation patterns, Coils, Radiofrequency.

The antenna is of the type having a reflector disk. Structure is provided for reducing the percentage of power received by a wave-guide horn from the ground-illumination region. A ground horn is positioned around the mouth of the wave-guide horn for preventing the H-plane component of the undesired power from being radiated into the ground-illumination region. A radio-frequency choke structure is also provided.

PB-168 555 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aerospace Div.
VOLTAGE CALIBRATOR TS-1333/U.
Technical manual instrument calibration procedure AE-20.
1 Jul 65, 11p
Contract N123 62861 35056A
NAVWEPS 17-20AE-20

Unclassified report

Descriptors: (*Voltmeters, Calibration), (*Test equipment(Electronics), Voltmeters), Signals, Measurement, Instruction manuals, Test methods.

The manual describes the calibration of the TS-1333/U Voltage Calibrator. The Test Instrument enables accurate measurement of low frequency electrical signals.

PB-168 556 Field 9E, 9A
CFSTI Prices: HC$3.00 MF$0.75

Purdue Univ., Lafayette, Ind. Electronic Systems Research Lab.
LOWER BOUNDS ON THE THRESHOLDS OF SUBHARMONIC OSCILLATIONS,
by D. R. Anderson and T. N. Trick. 1965, 72p
Rept. no. PRF-4108
Grant NSF GK26

Unclassified report

Descriptors: (*Harmonic oscillators, Boundary value problems), (*Electrical networks, Harmonic oscillators), Oscillators, Capacitance, Resistance(Electrical), Inductance, Transients, Parametric amplifiers, Frequency converters, Matrix algebra, Iterative methods.

A lumped linear time-invariant strictly positive real network is considered in which is embedded an arbitrary number of nonlinear elements and bounded periodic sources. It is assumed that there is no coupling between the nonlinear elements and that the first and second derivatives exist and are continuous within a certain allowable dynamic range of operation of the nonlinear elements. The first derivative should be positive at the bias point. Upper bounds on the source amplitudes are determined such that the steady state solution is in the allowable dynamic range, as well as being unique and periodic with the same period as the sources. This bound on the dynamic range can be readily computed in terms of the poles and residues of a linearized model of the above nonlinear circuit. All the nonlinear elements need not be required to have the same bound on the dynamic range. These bounds yield estimates of the maximum allowable source amplitudes such that no subharmonic oscillations occur, if the unique solution is stable.

SC-DC-65-1421 Field 9A, 20E
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THE USE OF LASERS TO SIMULATE RADIATION-INDUCED TRANSIENTS IN SEMICONDUCTOR DEVICES AND CIRCUITS,
by Donald H. Habing. May 65, 37p CONF-650707-1
Contract AT(29-1)-789 Unclassified report

Presented at the IEEE Annual Conference on Nuclear and Space Radiation Effects, Ann Arbor, Mich.

Descriptors: (*Semiconductor devices, Transients), (*Transients, Lasers).

SC-DC-65-1426 Field 9B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A LOGIC FOR MULTIPLE-GENERATION TRACING OF STRUCTURES,
by W. F. Jemison and H. B. Souther. May 65, 24p
CONF-650527-2
Contract AT(29-1)-789
Unclassified report

Presented at the Association for Computing Machinery, Rio Grande Chapter Meeting, Phoenix, Ariz.

Descriptors: (*Computer logic, Selection).

SC-TM-64-1774 Field 9E, 9B
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
IMPROVED ADVANCE AND PRIME PULSE GENERATOR FOR DRIVING MAGNETIC LOGIC DEVICES,
by E. J. Bernard. Jan 65, 27p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Pulse generators, Computer logic), (*Computer logic, Pulse generators).

SC-TM-64-2154 Field 9C, 9A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A VOLTAGE BREAKDOWN DETECTOR,
by E. L. Shaffstall. Feb 65, 7p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Voltage, Reliability(Electronics)), (*Electric insulation, Failure(Mechanics)), (*Monitors, Electric insulation).

SC-TM-65-3 Field 9D, 12A
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THE RECONSTRUCTION OF AN ANALOG SIGNAL FROM NONUNIFORMLY SPACED SAMPLES,
by G. H. Honnold. Feb 65, 36p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Sampling, Communication theory), (*Communication theory, Sampling).

SC-TM-65-84 Field 9E, 22B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A LOW-NOISE, LOW-FREQUENCY AMPLIFIER,
by D. L. Caskey. Feb 65, 5p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Amplifiers, Low-frequency), Satellites(Artificial).

UCID-1966 Field 9B
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Berkeley.
PEPR AND OTHER SYSTEMS,
by A. H. Rosenfeld and H. D. Taft. 1962, 58p
Memo. no. 440
Contract W-7405-eng-48
Unclassified report

Prepared in Cooperation with Yale Univ., New Haven, Conn.

Descriptors: (*Pattern recognition, Programming-(Computers)), (*Programming(Computers), Pattern recognition), Coding, Reading machines.

UCRL-12342-T Field 9B, 6D, 12A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
A MULTIPURPOSE THEOREM PROVING HEURISTIC PROGRAM THAT LEARNS,
by James R. Slagle. Jan 65, 6p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Programming(Computers), Learning), (*Artificial intelligence, Mathematical logic).

10. Energy Conversion (Non-propulsive)

N65-15814 Field 10C
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Schenectady, N. Y. Advanced Technology Labs.
CHARACTERIZATION OF NICKEL-CADMIUM ELECTRODES.
Quarterly rept. no. 5, 1 Jul-1 Oct 64.
1 Oct 64, 42p
Contract NAS5 3477 Unclassified report
NASA CR-60418
Microfilmed from best available copy.

Descriptors: (*Electrodes, Analysis), (*Alkaline cells, Electrodes), Nickel, Cadmium.

N65-17211 Field 10C
CFSTI Prices: HC$3.00 MF$0.75

Gulton Industries, Inc., Metuchen, N. J. Alkaline Battery Div.
INVESTIGATION OF BATTERY ACTIVE NICKEL OXIDES.
Quarterly rept. no. 2, 12 Sep-12 Dec 64,
by P. Ritterman. 12 Dec 64, 61p
Contract NAS3 4178 Unclassified report
NASA CR-54295
Microfilmed from best available copy.

Descriptors: (*Alkaline cells, Nickel compounds), (*Nickel compounds, Oxides).

N65-20420 Field 10B, 10A
CFSTI Prices: HC$2.00 MF$0.50

TAPCO Div., Thompson Ramo Wooldridge, Inc., Cleveland, Ohio.

SUNFLOWER POWER CONVERSION SYSTEM.
Quarterly rept. Mar-May 63.
1963, 35p ER-5386
NASA CR-57643

Unclassified report

Descriptors: (*Energy conversion, Rankine cycle), (*Generators, Turbines), (*Power supplies, Solar radiation).

N65-20791 Field 10B
CFSTI Prices: HC$4.00 MF$1.00

TAPCO Div., Thompson Ramo Wooldridge, Inc., Cleveland, Ohio.
SOLAR RANKINE SYSTEM PERFORMANCE AND STATUS SUMMARY.
24 Jul 62, 141p ER-4955
NASA CR-57765

Unclassified report

Descriptors: (*Energy conversion, Rankine cycle), (*Power supplies, Solar radiation), (*Generators, Turbines).

N65-22371 Field 10B, 10C
CFSTI Prices: HC$2.00 MF$0.50

Alfred Univ., N. Y.
FUEL CELL RESEARCH. AN INVESTIGATION OF NON-STEADY-STATE OPERATION.
Semiannual rept. no. 3, Jun 1-Dec 31 64,
by T. J. Gray, A. A. Schneider, and R. B. Rozelle.
1964, 38p
Grant NsG384
NASA CR-54300

Unclassified report

Descriptors: (*Fuel cells, Scientific research).

N65-23276 Field 10A
CFSTI Prices: HC$3.00 MF$0.75

Allis-Chalmers Mfg. Co., Milwaukee, Wis. Research Div.
RESEARCH AND DEVELOPMENT ON FUEL CELL SYSTEMS.
Quarterly progress rept. no. 3, Mar 31 65,
by J. L. Platner. 26 Apr 65, 78p
NAS8-2696-QPR-003
Contract NAS8 2696
NASA CR-62611

Unclassified report

Descriptors: (*Fuel cells, Reviews).

N65-23929 Field 10B, 10A
CFSTI Prices: HC$3.00 MF$0.50

Electro-Optical Systems, Inc., Pasadena, Calif.
EVALUATION OF REGENERATIVE FUEL CELL.
Final rept. for 21 Sep 60-9 Mar 62,
by Harvey A. Frank. 9 Apr 62, 54p
Rept. no. EOS-1584
Contract NAS7-7
NASA CR-62757

Unclassified report

Descriptors: (*Fuel cells, Performance-(Engineering)).

N65-30959 Field 10B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANALYSIS OF A RADIAL-FLOW HALL CURRENT MAGNETOHYDRODYNAMIC GENERATOR,
by Lester D. Nichols. Aug 65, 17p
NASA TND-2973

Unclassified report

Descriptors: (*Magnetohydrodynamics, Energy conversion), (*Energy conversion, Magnetohydrodynamics).

N65-31145 Field 10B, 10A, 18N
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
THERMODYNAMIC AND TURBOMACHINERY CONCEPTS FOR RADIOISOTOPE AND REACTOR BRAYTON-CYCLE SPACE POWER SYSTEMS,
by Arthur J. Glassman. Aug 65, 32p
NASA TND-2968

Unclassified report

Descriptors: (*Turbines, Spacecraft), (*Auxiliary power plants, Brayton cycle).

N65-32871 Field 10B, 10A, 18N
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
COLD PERFORMANCE EVALUATION OF A 6.02-INCH RADIAL INFLOW TURBINE DESIGNED FOR A 10-KILOWATT SHAFT OUTPUT BRAYTON CYCLE SPACE POWER GENERATION SYSTEM,
by Milton G. Kofskey and Donald E. Holeski.
Sep 65, 24p
NASA TND-2987

Unclassified report

Descriptors: (*Turbines, Spacecraft), (*Auxiliary power plants, Brayton cycle).

Patent 3,205,381 Field 10C, 10A

IONOSPHERIC BATTERY.
Patent assigned to NASA,
by Leslie G. Smith. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Batteries + components, Ionosphere), (*Ionosphere, Electrolytes), Electrodes, Spacecraft, Circuits, Satellites(Artificial), Power supplies, Gold, Platinum, Patents.

The ionospheric-type battery utilizes the ionosphere or other ionized medium existing in outer space as a supplemental source of energy for the electrical circuits of a space vehicle. This source operates when the vehicle is shielded from the sun. The vehicle carries a plurality of electrodes on its outer surface. The electrodes are rod shaped and are made of materials having different contact potentials. The electrodes are connected together through a load circuit.

Patent 3,207,149 Field 10A

CHEMOELECTRIC HEAT SOURCE.
Patent assigned to Navy,
by William C. Spindler. 21 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fuel cells, Heaters), (*Heaters, Energy conversion), Patents, Electrolytes, Anodes(Electrolytic cell).

Heat is generated from the conversion of chemical to electrical to thermal energy. The structure includes a folded cathode metal enclosing the other two main components of the electrochemical cell, that is, the anode and electrolyte.

11. Materials

AGN-8143 Field 11F, 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Aerojet-General Nucleonics, San Ramon, Calif.
ALKALI METALS EVALUATION PROGRAM.
Quarterly progress rept. for 1 Jan-31Mar 65,
by C. R. Fisher and P. Y. Achener. May 65, 21p
Contract AT(04-3)-368
Unclassified report

Descriptors: (*Alkali metals, High-temperature research), Rubidium, Cesium, Potassium, Heat transfer.

BDX-613-34 Field 11F, 13H, 14B
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
TIMESAVING WITH A PARALLEL ANALYZING CHANNEL ATTACHMENT,
by James S. Carson. Jun 62, 6p
Contract AT(29-1)-613
Unclassified report

Presented to Norelco Reporter magazine vx n3 1963.

Descriptors: (*Metals, Plating), (*Plating, Thickness).

BMI-X-256 Field 11B
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
A STUDY TO IMPROVE THE REMNANT POLARIZATION OF PZT FERROELECTRIC CERAMICS.
Summary report,
by H. D. Hanes, E. G. Bodine, and E. S. Hodge.
13 Sep 63, 31p
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Ceramic materials, Ferroelectric materials), (*Ferroelectric materials, Polarization), Lead compounds, Zirconium compounds, Titanium compounds, Oxides.

BNWL-44 Field 11F, 18H
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
THE EFFECT OF NEUTRON IRRADIATION ON SLIP-LINES IN MOLYBDENUM,
by J. L. Brimhall. Mar 65, 17p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Radiation damage, Molybdenum), (*Crystal structure, Molybdenum), Neutron beams.

BNWL-91 Field 11B, 18J
CFSTI Prices: HC$4.00 MF$1.00

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
CERAMICS RESEARCH AND DEVELOPMENT.
Quarterly rept. for Jan-Mar 65.
Mar 65, 125p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Ceramic materials, Scientific research).

CNLM-6246 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Aircraft Nuclear Engine Lab.
CORROSION STUDIES OF REFRACTORY METAL ALLOYS IN BOILING POTASSIUM AND LIQUID NAK,
by K. J. Kelly, S. S. Biecherman, and J. E. Hodel.
22 Apr 65, 22p CONF-650434-1
Contract AT(30-1)-2789
Unclassified report

Prepared from AEC-NASA Liquid Metals Information Meeting, Oak Ridge, Tenn.

Descriptors: (*Refractory metal alloys, Corrosion), (*Corrosion, Refractory metal alloys), Corrosive liquids, Potassium, Liquid metals, Sodium alloys, Potassium alloys, Compatibility.

EURAEC-1223 Field 11B, 20B, 11F
CFSTI Prices: HC$1.00 MF$0.50

Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
IMPERFECTIONS IN METALS. II. CORROSION AND OXIDATION.
Quarterly rept. no. 7, 1 Apr-30 Jun 64.
30 Jun 64, 18p EUR-2053; R-2314
Contract 082-62-7 RDB
Unclassified report

Descriptors: (*Oxides, Films), (*Titanium, Oxidation), Optical analysis.

EURAEC-1404 Field 11B, 20B, 11F
CFSTI Prices: HC$2.00 MF$0.50

Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
IMPERFECTIONS IN METALS. II. CORROSION AND OXIDATION.
Quarterly rept. no. 8, 1 Jul-31 Sep 64.
31 Sep 64, 32p EUR-2363; R-2316
Contract 082-62-7 RDD
Unclassified report

Descriptors: (*Rutile, Crystal lattice defects), (*Titanium, Oxidation), Films, Recrystallization.

N65-17540 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
ANISOTROPIC DILATION DURING ANNEALING OF 18% NICKEL MARAGING STEEL,
by H. H. Kranzlein. 18 Dec 64, 25p
NASA-TM-X-53184
Unclassified report

Descriptors: (*Maraging steels, Anisotropy), (*Nickel alloys, Heat treatment).

N65-17996 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
LOW TEMPERATURE MECHANICAL PROPERTIES OF 8AI-1Mo-1V TITANIUM ALLOYS AND COMPOSITE WELDMENTS,
by C. R. Denaburg. 11 Dec 64, 19p
NASA-TM-X-53178

Unclassified report

Descriptors: (*Titanium alloys, Low temperature research), (*Welds, Titanium alloys), Aluminum alloys, Molybdenum alloys, Vanadium alloys.

N65-19893 Field 11H
CFSTI Prices: HC$2.00 MF$0.50

SKF Industries, Inc., King of Prussia, Pa. Research Lab.
BEARING LUBRICANT ENDURANCE CHARACTERISTICS AT HIGH SPEEDS AND HIGH TEMPERATURES.
Progress rept. no. 9, 1 Oct-31 Dec 64,
by C. J. Wachendorfer. 31 Dec 64, 43p
Contract NASw492, Proj. IX1
NASA CR-57445

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Lubricants, Bearings), (*Bearings, Lubricants).

N65-21768 Field 11F
CFSTI Prices: HC$4.00 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
THE DEVELOPMENT OF MAGNESIUM-LITHIUM ALLOYS FOR STRUCTURAL APPLICATIONS.
Final technical rept.,
by T. G. Byrer, E. L. White, and P. D. Frost.
25 Jan 63, 106p
Contract NAS8 5049
NASA CR-62219

Unclassified report

Descriptors: (*Magnesium alloys, Material forming), (*Lithium alloys, Material forming).

N65-22354 Field 11J
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. Marshall Space Flight Center.
ACCELERATED COMPRESSION SET PROPERTIES OF FOURTEEN ELASTOMERS,
by C. D. Hooper and J. T. Schell. 2 Apr 65, 49p
NASA TM-X-53232

Unclassified report

Descriptors: (*Elastomers, Compressive properties).

N65-25974 Field 11F, 20C
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PHONON-DRAG THERMOPOWER IN CU-AL AND CU-SI ALLOYS.
Technical rept.,
by Irving Weinberg. 1 May 65, 15p
Rept. no. JPL-TR-32-730
NASA CR-63333

Unclassified report

Descriptors: (*Thermoelectricity, Copper alloys), (*Phonons, Transport properties), Aluminum alloys, Silicon alloys.

N65-27639 Field 11I, 10B, 22B
CFSTI Prices: HC$6.00 MF$1.25

Goodyear Aerospace Corp., Akron, Ohio.
DEVELOPMENT OF A PREDISTRIBUTED AZIDE POLYURETHANE FOAM FOR RIGIDIZATION OF SOLAR CONCENTRATORS IN SPACE.
Final rept.,
by N. Jouriles and C. E. Welling. Jun 65, 240p
Contract NAS1 3301
NASA CR-235

Unclassified report

Descriptors: (*Solar furnaces, Reinforcing materials), (*Isocyanate plastics, Solar furnaces), (*Expanded plastics, Solar furnaces).

N65-29845 Field 11H, 11F
CFSTI Prices: HC$1.75 MF$1.00

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
LUBRICATION, CORROSION, AND WEAR: A CONTINUING BIBLIOGRAPHY.
Jun 65, 162p NASA-SP-7020

Unclassified report

Descriptors: (*Lubrication, Bibliographies), (*Corrosion, Bibliographies), (*Wear resistance, Bibliographies).

N65-30398 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

National Bureau of Standards, Washington, D. C.
THE EFFECT OF ENVIRONMENT ON THE FATIGUE STRENGTHS OF FOUR SELECTED ALLOYS,
by T. R. Shives and J. A. Bennett. Aug 65, 22p
NASA Order R14
NASA CR-267

Unclassified report

Descriptors: (*Steel, Fatigue(Mechanics)), (*Magnesium alloys, Fatigue(Mechanics)), (*Brass, Fatigue(Mechanics)), (*Titanium alloys, Fatigue-(Mechanics)).

NMI-4787 Field 11F, 13H
CFSTI Prices: HC$3.00 MF$0.75

Nuclear Metals, Inc., West Concord, Mass.
PROPERTIES OF THE BERYLLIUM - ZIRCONIUM BRAZING ALLOY.
Final rept.,
by R. R. Krom and A. R. Kaufmann. 14 Nov 63, 64p
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Soldering alloys, Zirconium alloys), (*Zirconium alloys, Beryllium alloys), Brazing.

NMI-TJ-60 Field 11F, 13H, 20B
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Metals, West Concord, Mass.
THE EFFECTS OF PURIFICATION AND REALLOYING ON THE MECHANICAL PROPERTIES OF ZONE-REFINED BERYLLIUM SINGLE CRYSTALS,

by D. F. Kaufman and L. R. Aronin. 27 Nov 64, 18p
CONF-729-20
Contract AT(30-1)-2784
Unclassified report

Presented at the International Conference on Beryllium Technology, Philadelphia, 15-17 Oct 1964.

Descriptors: (*Beryllium, Single crystals), (*Purification, Beryllium), Mechanical properties, Zone melting.

NYO-3087-4 Field 11F, 20F
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y. Dept. of Engineering Physics.
CORRELATION OF PHYSICAL PROPERTIES OF CRYSTALS WITH MICROSTRUCTURE.
Annual progress rept. for 1964-1965,
by J. Silcox. 1965, 5p
Contract AT(30-1)-3087
Unclassified report

Descriptors: (*Cyrstals, Physical properties), (*Microstructure, Crystal), Nickel alloys, Nickel.

ORNL-3795 Field 11F, 18B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
A BIBLIOGRAPHY ON TRACER DIFFUSION IN METALS. PART I. SELF-DIFFUSION IN PURE METALS,
by John Askill. May 65, 26p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Diffusion, Tracer studies), (*Tracer studies, Metals), Bibliographies.

ORNL-TM-1029 Field 11F, 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
LABORATORY CORROSION STUDIES FOR THE HIGH FLUX ISOTOPE REACTOR,
by J. L. English and J. C. Griess. Jun 65, 40p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Corrosion, Reactor materials), (*Reactor materials, Corrosion), Environment tests.

ORNL-TM-1080 Field 11F, 20B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
EFFECTS OF PYROLYTIC-GRAPHITE STRUCTURE ON DIFFUSION OF THORIUM,
by Frederick Libben Carlsen, Jr. Jun 65, 101p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Pyrolytic graphite, Crystal structure), (*Thorium, Diffusion).

ORNL-TM-1124 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
HIGH-TEMPERATURE CREEP BEHAVIOR OF TYPE 304 STAINLESS STEEL IN ARGON-OXYGEN ENVIRONMENT OF DIFFERENT OXYGEN PARTIAL PRESSURES.
Master's thesis,
by P. Rodriguez. 5 May 65, 68p
Contract W-7405-eng-26
Unclassified report

Submitted to the Univ. of Tennessee.

Descriptors: (*Stainless steel, Creep), (*Creep, Stainless steel).

ORNL-TM-1146 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
PRODUCTION OF A LOW-BORON HEAT OF HASTELLOY N,
by W. R. Martin, H. E. McCoy, and J. R. Weir.
11 Jun 65, 3p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nickel alloys, Melting), (*Boron, Nickel alloys), Impurities.

Patent 3,206,440 Field 11I, 11C

VINYL ESTERS OF MALEIC ANHYDRIDE ADDUCTS.
Patent assigned to Agriculture,
by Glen W. Hedrick. 14 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Polyester plastics, Synthesis-(Chemistry)), (*Vinyl plastics, Copolymerization), (*Plastic coatings, Preparation), Polyvinyl chloride, Acetates, Anhydrides, Fatty acid esters, Patents.

A vinyl ester of maleopimaric acid is claimed. Homopolymers and copolymers are disclosed. A copolymer is made of vinyl chloride or vinyl acetate and a member selected from the group consisting of the vinyl ester of maleopimaric acid and the vinyl ester of hydrogenated maleinated eleostearic acid.

Patent 3,208,870 Field 11C, 18J

CARBIDE COATINGS FOR GRAPHITE.
Patent assigned to AEC,
by Filmore F. Criss. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Graphite, Refractory coatings), (*Refractory coatings, Carbides), (*Carbides, Refractory coatings), Patents, Niobium compounds, Tantalum compounds, Oxides, Bonding, Reactor materials, Paints, Heat treatment, Erosion, Wear resistance.

A graphite surface is coated with a metal carbide by applying a covering layer of metal oxide in powder form to the surface and heating it in an inert atmosphere at about 2300 degrees C. The oxide is selected from the oxides of tantalum and columbium. The graphite coated surfaces are used in nuclear reactors.

Patent 3,208,872 Field 11C, 18J

CARBIDE COATINGS ON GRAPHITE.
Patent assigned to AEC,

by Filmore F. Criss and Cornel Wohlberg.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Graphite, Refractory coatings), (*Refractory coatings, Carbides), (*Carbides, Refractory coatings), Patents, Niobium compounds, Vanadium compounds, Tantalum compounds, Oxides, Bonding, Reactor materials, Pipes, Erosion, Wear resistance.

The graphite coated structures are used in gas cooled nuclear reactors. A graphite tube is coated with a metal carbide by filling the tube with a metal oxide, such as tantalum oxide and closing the rear opening. A furnace is filled with an inert gas and heated. The tube is passed through the furnace at about 2 inches per minute and the hot region is adjusted so that the front opening of the tube is within the hot region when the rear opening enters the hot region.

Patent 3,208,937 Field 11H, 11K

PROCESS FOR OBTAINING SILICEOUS AMINO COMPOUNDS.
Patent assigned to Nopco Chemical Co., Newark, N. J.,
by Frederick J. Ihde, Jr., James J. Bayone, and Arthur D. Lahr. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Silicon compounds), (*Solvents, Additives), (*Silicon compounds, Lubricant additives), (*Organic nitrogen compounds, Lubricant additives), Oils, Greases, Viscosity, Silicates, Gels, Aromatic compounds, Fluorine compounds, Carboxylic acids, Amines, Amides, N-heterocyclic compounds, Patents.

Siliceous amino compounds are used as thickeners for oil, greases and solvents. Fine particles of siliceous amino compounds are prepared by reacting a water soluble salt with an acid thereby forming a silica gel, which is allowed to digest at standard and then elevated temperatures. Thereafter a partial amide salt is reacted with a water soluble silicate salt in the presence of the silica gel. The siliceous amino compound formed has a very small and fine partical size and a large surface area giving it a greater thickening and bodying action.

Patent 3,208,938 Field 11H

LUBRICATING COMPOSITIONS.
Patent assigned to Shell Oil Co., New York,
by Hyman Ratner. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Polymers), (*Polymers, Lubricant additives), (*Organic nitrogen compounds, Lubricant additives), Pyridines, Acrylic resins, Copolymerization, Amides, Fatty acids, Phosphates, Polyamide plastics, N-heterocyclic compounds, Acetates, Cleaning compounds, Wear resistance, Antioxidants, Patents.

From 0.1 to 10 percent each of an oil-soluble copolymer of C-vinyl pyridine and a mixture of dissimilar long chain alkyl methacrylates and an oil-soluble complex of dioleyl amide of N-2 aminoethyl piperazine and a mixture of nono and dilauryl acid phosphate are added to lubricating compositions as detergents. Mineral lubricating oils containing these non-ash forming polymeric nitrogen-containing compounds possess good detergency, antiwear, and corrosion or rust inhibiting properties. Mineral lubricating oils containing these detergents are useful in aviation engines, automotive and truck engines and industrial equipment.

Patent 3,208,939 Field 11H, 21D

STABILIZATION OF ORGANIC SUBSTANCES.
Patent assigned to Universal Oil Products Co.,
Des Plaines, Ill.,
by Edwin J. Latos and Charles M. Hayes.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Organic materials, Stabilization), (*Petroleum, Stabilization), (*Lubricant additives, Polycyclic compounds), (*Polycyclic compounds, Lubricant additives), Halogen compounds, Carboxylic acids, Amines, Polymers, Kerosene, Jet engine fuels, Fuel oils, Patents.

Polyhalo polyhydro alkano naphtsalene dicarboxylic acids and derivatives thereof when reacted with an amine forms a product which is used for the stabilization of oils such as kerosene, jet fuel, lubricating oil, diesel oil, drying oils and grease. One example is prepared by reacting 5, 6, 7, 8, 9, 9-hexachloro-1, 2, 3, 4, 4a, 5, 8, 8a-octahydro-1, 4, 5, 8-dimethano-2, 3-naphthalene carboxylic anhydride with 'Diam 26'.

Patent 3,208,940 Field 11H, 13H

LUBRICATING COMPOSITIONS AND METHODS OF LUBRICATING,
Patent assigned to General Electric Co.,
by Robert S. Owens and Leon E. St. Pierre.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Aluminum, Lubrication), (*Lubrication, Aluminum), (*Lubricant additives, Preparation), Fatty acid esters, Alkenes, Aluminum alloys, Material forming, Stearates, Ethers, Patents.

Methyl stearate or ethyl tetradecyl ether and tetradecene-2, decene-1, or cetene are combined to form a lubricating composition used in the working of aluminum or aluminum alloys. The lubricant contains from 5 to 95 percent by weight of the stearate or ether and from 95 to 5 percent by weight of the olefin. The lubricating composition is used in the shaping of aluminum metal by stamping, drawing, extrusion, spinning and cold-rolling.

Patent 3,208,941 Field 11H, 13H

OLEFIN-UNSATURATED ESTER LUBRICANTS.
Patent assigned to General Electric Co.,
by Robert S. Owens. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Aluminum, Lubrication), (*Lubricants, Esters), (*Lubricant additives, Preparation), Alkenes, Fatty acid esters, Aluminum alloys, Material forming, Patents.

A long-chain olefin such as decyl acrylate or octyl acrylate and an organic polar-group-containing compound such as cetene or decene are used as metal-working lubricants under high pressure conditions. From 5 to 95 percent by weight of acrylate and from 95 to 5 percent by weight olefin are used as lubricating compositions in the shaping of aluminum metal by stamping, drawing, extrusion, spinning and cold-rolling. The long-chain olefin and the organic polar-group-containing compound may be used as additives to other lubricants to impart improved boundary lubricating characteristics.

Patent 3,208,942 Field 11H

LUBRICATING COMPOSITIONS CONTAINING POLYMERIC PHOSPHONITES.
Patent assigned to Shell Oil Co., New York,
by Peter Kirby. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Organic phosphorus compounds), (*Polymers, Lubricant additives), (*Organic phosphorus compounds, Lubricant additives), Fatty acid esters, Copolymerization, Acrylic resins, Pressure, Mineral oils, Fuel oils, Greases, Hydraulic fluids, Patents.

The polymerization product of a divinyl or diallyl derivative of phosphonous acid and an acrylic or alpha-substituted acrylic ester imparts heightened load carrying characteristics to mineral and synthetic lubricating oils. The acrylic acid ester contains from 12 to 20 carbon atoms in the alkyl radical, and is exemplified by lauryl or stearyl methacrylate. Diallyl phenylphosphonite, diallyl ethylphosphonite, or divinylphenylphosphonite is reacted with the methacrylate in the presence of an organic peroxide catalyst, and the mol ratio varies from 1:2 to 1:10. The copolymer is a dispersant for engine oils, and can be used to impart increased wear-inhibiting properties to hydraulic fluids.

Patent 3,208,943 Field 11H

COPOLYMERS OF ALKENYL PHOSPHORUS ESTERS AS LUBRICATING OIL ADDITIVES.
Patent assigned to Shell Oil Co., New York,
by Peter Kirby. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Phosphates), (*Phosphates, Lubricant additives), (*Organic phosphorus compounds, Lubricant additives), (*Polymers, Lubricant additives), Fatty acid esters, Copolymerization, Acrylic resins, Pressure, Patents.

A polymeric extreme pressure additive for lubricating oils having a viscosity ranging from 100 SUS at 100 degrees F. to 100 SUS at 210 degrees F. is a copolymer of a di- or triallyl phosphate and an alkyl methacrylate having from 8 to 18 carbon atoms in the alkyl radical. Representative compounds of the phosphorus-containing monomer are diallyl phenyl phosphonate, diallyl hydrogen phosphate, or diallyl butyl phosphonate. The molar ratio of phosphonate to lauryl methacrylate varies from 1:4 to 1:8. Engine, gear, and turbine oils charged with from 0.1 to 8 percent by weight of the compound exhibit improved viscosity/temperature characteristics.

Patent 3,208,944 Field 11H

STABILIZATION OF LUBRICANTS.
Patent assigned to Universal Oil Products Co., Des Plaines, Ill.
by Henryk A. Cyba. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricants, Stabilization), (*Lubricant additives, Antioxidants), (*Antioxidants, Lubricant additives), Ethers, Fatty acid esters, Acrylic resins, Amines, Hydraulic fluids, Patents.

An anti-oxidant for synthetic lubricants used as winter grade crankcase oils, aviation instrument lubricants, and aircraft gas turbine oils is composed of a diaminodiphenyl or aminophenyl alkoxyphenyl ether and the polymeric condensation product of an acrylate and an alkylaminoalkyl acrylate. The condensation polymer, formed at temperatures of from 100 to 175 degrees F., consists of from 50 to 95 weight percent of lauryl methacrylate and from 5 to 50 weight percent of beta-diethylaminoethyl methacrylate. The mol ratio of methacrylate polymer to ether ranges from 0.1:1 to 4:1. Synthetic lubricants containing from 0.001 to 5 weight percent of the additive retain lubricity and viscosity over temperatures ranging from -65 to 425 degrees F. The additive may be used in petroleum oils for automotive, marine, and diesel engines as well as in slushing oil and hydraulic fluid.

Patent 3,208,945 Field 11H

RUST RESISTANT LUBRICANT COMPOSITION.
Patent assigned to California Research Corp., San Francisco, Calif.
by Frank A. Stuart and Warren Lowe. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Antioxidants), (*Antioxidants, Lubricant additives), Anhydrides, Linoleic acid, Polymers, Succinates, Iron, Corrosion inhibition, Patents.

A rust inhibitor formed from a monoalkenyl succinic anhydride having from 8 to 18 carbon atoms in the alkenyl radical and a hydrogenated polymer of linoleic acid is utilized in mineral lubricating oils in conjunction with an ashless polymeric detergent having a molecular weight ranging from 100,000 to 1,000,000. Copolymers of butyl, dodecyl, and octadecyl methacrylate and N-vinyl pyrrolidone are combined with copolymers of similar methacrylates and polyethylene glycol monomethacrylate to form the detergent composition. The succinic anhydride may be an octenyl, tetrapropenyl, or triisobutenyl succinic anhydride. The rust inhibiting compound is composed of from 50 to 90 percent by weight of the succinic anhydride and from 10 to 50 weight percent of the linoleic acid polymer. A lubricating composition for internal combustion engines contains from 0.1 to 3 weight percent of the anti-rust agent, and from 0.1 to 10 percent of the detergent.

Patent 3,208,946 Field 11H

LUBRICANTS AND ADDITIVES THEREFOR.
Patent assigned to Shell Oil Co., New York,
by William S. Anderson and Richard D. Mullineaux.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lubricants, Stabilization), (*Lubricant additives, Polymers), (*Polymers, Lubricant additives), Polyethylene plastics, Styrene plastics, Copolymerization, Solvents, Catalysts, Metalorganic compounds, Lithium compounds, Patents.

Minor amounts of a copolymer of ethylene and alpha-ethyl- or alpha-methylstyrene are used to improve the oxidation and thermal stability of turbine, transformer, and industrial and automotive oils. The additive is produced by polymerizing a mixture of from 20 to 99 mol percent of ethylene with from 80 to 1 mol percent of alpha-methylstyrene in the presence of an organolithium catalyst and a tetrahydrofuran, dioxane, or diethyl ether solvent. The temperatures employed range from -30 to 30 degrees C. Lubricating compositions for mining machinery, elevators, aircraft control systems, and automotive engine oils contain from 0.01 to 5 weight percent of the additive. The oils may contain from 0.1 to 1 percent of a phenolic anti-oxidant such as 2,6-ditertbutyl-4-methylphenol to enhance oxidation stability and anti-scuffing properties.

TID-21647 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Temple Univ., Philadelphia, Pa. Research Inst.
SIMPLE RELATIONSHIP BETWEEN ELECTRICAL CONDUCTIVITY OF LIQUID METALS AND TEMPERATURE, OVER THEIR ENTIRE LIQUID TEMPERATURE RANGE, I.E., FROM THE MELTING POINT TO THE CRITICAL POINT,
by Aristid V. Grosse. 22 Nov 64, 44p
Contract AT(30-1)-2082

Unclassified report

Descriptors: (*Liquid metals, Electrical conductance).

UCRL-7913 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
LEVITATION MELTING OF BERYLLIUM AND ALUMINUM,
by R. F. Bunshah and R. S. Juntz. Jun 64, 13p
CONF-603-11
Contract W-7405-eng-48

Unclassified report

Prepared for presentation at vacuum metallurgy conference, American Vacuum Society, New York, 29 Jun - 1 Jul 1964.

Descriptors: (*Beryllium, Melting), (*Aluminum, Melting).

UCRL-10316 Field 11B, 20B
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
PLASTIC DEFORMATION OF MgO SINGLE CRYSTALS UP TO 1600 DEGREE C,
by Stephen M. Copley and Joseph A. Pask. 7 Apr 64, 39p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Single crystals, Deformation), (*Magnesium compounds, Oxides).

UCRL-16018 Field 11B
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
KINETICS OF VAPORIZATION OF ALUMINUM NITRIDE AND MAGNESIUM NITRIDE .
Doctoral thesis,
by Bette A. H. Blank. 23 Apr 65, 45p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Refractory materials, Nitrides), (*Nitrides, Thermodynamics), Sublimation, Reaction kinetics, Aluminum compounds, Magnesium compounds.

Y-889 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
SELECTED PHYSICAL PROPERTIES OF MERCURY IN THE TEMPERATURE RANGE 100 TO 1000 DEGREE C. A LITERATURE SEARCH,
by Frances Sachs. 10 Jul 62, 37p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Mercury, Physical properties), High-temperature research.

12. Mathematical Sciences

N65-17514 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Seton Hall Univ., South Orange, N. J.
ON AN ITERATIVE PROCESS IN THE SOLUTION OF THE REGULAR N-BODY PROBLEM,
by L. M. Rauch. 1965, 27p
Grant NSG413
NASA CR-60865

Unclassified report

Descriptors: (*N-body problem, Iterative methods), (*Iterative methods, N-body problem).

N65-18446 Field 12A
CFSTI Prices: HC$3.00 MF$0.75

Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
QUASI ISOMETRIC MAPPINGS IN HILBERT SPACE,
by F. John. Jan 65, 72p Rept. no. IMM-NYU-336
Grant NsG412
NASA CR-57135

Unclassified report

Descriptors: (*Mapping(Transformations), Functional analysis), (*Functional analysis, Mapping(Transformations)).

N65-22544 Field 12A, 16B, 22A
CFSTI Prices: HC$2.00 MF$0.50

Northeast Louisiana State Coll., Monroe. Dept. of Mathematics.
MULTIVARIABLE LEAST SQUARES APPROXIMATION AND ITS APPLICATION TO SOLVING PROBLEMS ASSOCIATED WITH SPACE VEHICLES,
Summary rept., 1 May 62-1 Feb 65,
by Daniel E. Dupree. 1 Feb 65, 34p
Contract NAS8 2642
NASA CR-62396

Unclassified report

Descriptors: (*Least squares method, Guided missile trajectories), (*Guided missile trajectories, Least squares method), Optimization, Spacecraft.

N65-25267 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Connecticut Univ., Storrs. Dept. of Electrical Engineering.
COMMENTS ON SYNTHESIS TECHNIQUES EMPLOYING THE DIRECT METHOD,
by Richard V. Monopoli. 3 May 65, 7p
Grant NsG 309-S3
NASA CR-63152

Unclassified report

Descriptors: (*Functional analysis, Control systems), (*Synthesis, Control systems).

N65-28630 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Research Triangle Inst., Durham, N. C.
THE VARIANCE OF THE NUMBER OF ZEROS OF STATIONARY NORMAL PROCESSES,
by J. D. Cryer and M. R. Leadbetter. Jul 65,
26p Technical rept. TR-3
Contract NASw905 Unclassified report
NASA CR-259

Descriptors: (*Stochastic processes, Analysis of variance), (*Analysis of variance, Stochastic processes).

ORNL-P-1033 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
ON NONLINEAR MULTISTEP METHODS FOR ORDINARY INITIAL-VALUE PROBLEMS,
by William B. Gragg. 1965, 9p CONF-650207-1
Contract W-7405-eng-26

Unclassified report

Presented at the Assn. for Computing Machinery Meeting, Huntsville, Ala.

Descriptors: (*Boundary value problems, Numerical methods + procedures), (*Operators(Mathematics), Boundary value problems).

SC-R-65-870 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THE THEORY OF CONES,
by D. R. Morrison. Mar 65, 49p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Conical bodies, Theory).

UCRL-7623 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
ON THE NON-EXISTENCE OF FIBONACCI SQUARES,
by Robert E. Shafer. Dec 63, 6p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Numbers, Theory).

UCRL-7806 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
LOMMEL FUNCTIONS OF IMAGINARY ARGUMENT,
by Robert E. Shafer. 8 Apr 64, 10p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Special functions(Mathematical), Complex variables).

WAPD-T-1695 Field 12A, 9E
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
THIRD ORDER TIME-VARYING SYSTEMS,
by W. C. Bean. Mar 64, 9p CONF-650105-1
Contract AT(11-1)-GEN-14

Unclassified report

Presented at Conference on Symmetry Principles at High Energy, Coral Gables, Fla.

Descriptors: (*Control systems, Differential equations), (*Differential equations, Control systems).

13. Mechanical, Industrial, Civil, and Marine Engineering

AD-447 896 Field 13J
CFSTI Price: HC$2.00

Marine Engineering Lab., Annapolis, Md.
NOISE CONSIDERATIONS IN METHODS OF REGULATING FLUID FLOW.
Research and development rept.,
by R. A. Milroy. 1 Oct 64, 40p
Rept. no. MEL-176-64 Unclassified report
Proj. SF 013 11 09, Task 02665

Descriptors: (*Submarine noise, Reduction), (*Fluid flow, Control systems), Hydraulic systems, Orifices, Friction, Oscillation, Acceleration, Magnetic fields, Valves.

Nine methods for regulating fluid flow are presented. They are designated as (1) original, (2) mechanical, (3) orificial, (4) frictional, (5) recirculational, (6) oscillational, (7) accelerational, (8) transitional, and (9) magnetical. Each method is explained together with its flow noise characteristics. Pertinent experimental studies of devices demonstrating several of the methods are included. (Author)

N65-17065 Field 13H, 11A
CFSTI Prices: HC$2.00 MF$0.50

Syracuse Univ., N. Y. Dept. of Chemical Engineering.

ADHESION BETWEEN AUTOMICALLY CLEAN SURFACES, II.
Final rept. 1 Sep 62-1 Jun 63,
by D. V. Keller, Jr. 1963, 41p
NSG-159 61
NASA CR-50834

Unclassified report

See also N62-15687.

Descriptors: (*Adhesion, Surface properties).

N65-19892 Field 13D, 21D
CFSTI Prices: HC$1.00 MF$0.50

Stainless Steel Products, Inc., Burbank, Calif.
Engineering Dept.
BELLOWS, TUNNEL FUEL TANK.
Summary rept.
3 Feb 65, 5p Rept. no. 2314
Contract NAS8 11583 Unclassified report
NASA CR-57451
Microfilmed from best available copy.

Descriptors: (*Fuel tanks, Design).

N65-22566 Field 13G
CFSTI Prices: HC$2.00 MF$0.50

Cadillac Gage Co., Detroit, Mich.
HYDRAULIC SERVOVALVE RELIABILITY IMPROVEMENT STUDY FOR NASA.
Progress rept. no. 5, 1 Nov-1 Dec 64.
1964, 26p CG9-13
Contract NAS8 11630
NASA CR-62278

Unclassified report

Descriptors: (*Hydraulic servomechanisms, Reliability), (*Hydraulic valves, Reliability).

N65-25998 Field 13K
CFSTI Prices: HC$1.00 MF$0.50

Pratt and Whitney Aircraft, Middletown, Conn.
INVESTIGATION OF CAVITATION DAMAGE OF MECHANICAL PUMP IMPELLERS OPERATING IN LIQUID METAL SPACE POWER LOOPS.
Quarterly progress rept. no. 3, 2 Jan-31 Mar 64,
by R. S. Kulp and J. V. Altieri. 15 Apr 64, 21p
Rept. no. CNLM-5208
Contract NAS3 2541
NASA CR-54032

Unclassified report

Descriptors: (*Impellers, Cavitation), (*Turbopumps, Cavitation), Liquid metal pumps.

NLCO-923 Field 13H, 18I
CFSTI Prices: HC$1.00 MF$0.50

National Lead Co. of Ohio, Cincinnati.
SINK-REDUCTION OF HEAVY-WALLED STEEL TUBES,
by Herbert Davis and Herbert W. Hesselbrock.
7 Dec 64, 16p CONF-650431-1
Contract AT(30-1)-1156

Unclassified report

Presented at the Association of Iron and Steel Engineers, Rolling Mill Conference, Birmingham, Ala.

Descriptors: (*Reactor cores, Mechanical working), (*Pipes, Mechanical working).

Patent 3,208,197 Field 13H, 7A

DIFFUSION SEPARATION OF FLUIDS.
Patent assigned to AEC,
by Franz E. Simon, Klaus Fuchs and Rudolph E. Peierls. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Gasous diffusion separation, Membranes), Mixtures, Patents, Porosity, Multiple operation, Gases, Vapors.

The multi-stage process is for the treatment of mixtures of gaseous or vaporous fluids by apparatus which separates the mixture into two fractions of different composition by diffusion through a porous membrane. A plurality of sub-cascades is used, each including a plurality of porous membranes. Each sub-cascade produces a depleted product.

Patent 3,208,225 Field 13K, 13B

SINKING FLOAT-OPERATED IRRIGATION GATE.
Patent assigned to Agriculture,
by Allan S. Humpherys. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Irrigation systems, Gate valves), (*Gate valves, Irrigation systems), Control systems, Patents, Floats, Operation, Automatic, Check valves.

The automatic check gate stops the flow of water in an irrigation ditch after the lapse of a predetermined time. A float is mounted to the gate and provided with a valve for admitting water at a controlled rate whereby the float loses its buoyancy and sinks in a predetermined time to close the gate. When the ditch is emptied, the water in the float runs out through the valve and the gate is again ready for another irrigation cycle.

Patent 3,208,293 Field 13G, 1C, 22C

LOW INERTIA ACTUATOR.
Patent assigned to Army,
by Josef Boehm. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Actuators, Control surfaces), Torque, Servomechanisms, Guide vanes, Aerial rudders, Patents.

The actuator may be used with servo systems for actuating control surfaces, such as rudders in airplanes and vanes in guided missiles. The actuator is provided with a very high reduction ratio between the input and the output revolutions-per-minute, so as to produce a large output torque.

Patent 3,208,397 Field 13K, 13J

QUIET HYDRAULIC PUMP.
Patent assigned to Navy,
by Alexander Lehrer and Guy L. Johnson. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Hydraulic pressure pumps, Reciprocating pumps), Patents, Noise, Shock(Mechanics), Hydraulic accumulators.

The reciprocating hydraulic pump is useful in ships and submarines because of quiet operation. Fluid containing chambers pressurize or decompress the cylinders at the end of the piston travel so as to reduce the shock which normally occurs when a cylinder is brought into a different pressure than that in the cylinder.

Patent 3,208,646 Field 13G, 17G

HYDROPNEUMATIC ACCUMULATOR.
Patent assigned to Army,
by Harold B. Wessenger. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Hydraulic accumulators, Guided missile components), Pneumatic devices, Guidance, Pneumatic valves, Explosives initiators, Patents.

The hydropneumatic accumulator is useful as a power plant for storing energy for a hydraulically operated guidance system of a guided missile. The structure includes an inner container with nitrogen gas at high pressure. An explosive squib is used to release a valve and permit flow of the gas to the inside of an elastic bladder which is positioned about the outside of the inner container. The space between the bladder and an outer casing is filled with oil. The pressurized oil flows out of a valve to various hydraulic motors of the guidance system.

Patent 3,208,699 Field 13D, 21E

ENGINE TRANSPORT STAND.
Patent assigned to Navy,
by Blanchard S. Hutchins and Paul Karnow. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Containers, Jet engines), (*Air transportation, Jet engines), (*Jet engines, Containers), Patents, Packaging, Handling, Packing materials, Aircraft engines, Transportation, Aluminum alloys.

The universal lightweight jet engine transport stand is for facilitating air shipping numerous types of existing and contemplated jet engines. The stand is made of rigid aluminum alloy beams, tubes and connectors. It can be collapsed when not in use. Cargo hoists or forklift trucks can be used in loading the stand into end-loaded or side-loaded aircraft.

Patent 3,208,773 Field 13K

INSULATED TUBE COUPLING.
Patent assigned to AEC,
by Warren E. Boudrie. 28 Sep 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Couplings, Electric insulation), (*Pipes, Couplings), (*Electric insulation, Pipe fittings), Pressure, Patents, Gaskets.

The coupling joins two metallic tubes together in axial alignment and maintain the two tubes electrically isolated from each other. The coupling prevents leakage or turbulence in tubing handling a high pressure and/or temperature gas or liquid. The housing and tubes are insulated from each other by two circular insulators and a gasket.

Patent 3,210,897 Field 13M

GROUND ANCHOR SECURING DEVICE.
Patent assigned to Army,
by Paul E. Whittington. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Anchors(Structural), Tents), (*Cements, Anchors(Structural)), Patents, Stabilization, Pressure, Gases, Operation, Soils.

The device is used to secure a ground anchor in loose or sandy soil. The anchor is used to secure a tent. The anchor pier is in the form of a pipe with exterior flutes and apertures toward the bottom. A container is designed for attachment to the top of the pin. The container is filled with a cement slurry. A CO2 cartridge is used to force the slurry through the pipe and out through the apertures.

Patent 3,210,938 Field 13K

PRESSURE OPERATED VALVE.
Patent assigned to Navy,
by William M. Mendez. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Intake valves, Rocket motors(Liquid propellant)), (*Valves, Propellant control), Patents, Pressure, Liquid rocket propellants.

The liquid propellent rocket motor is adapted for use over wide thrust ranges. Effective control of the proportion of liquid propellants delivered to the motor is obtained without regenerative oscillations due to fluctuations in combustion chamber pressure. A valve is provided for controlling fuel flow in the rocket motor operatively responsive to oxidant delivery pressures.

Patent 3,211,019 Field 13E

PUSH-PULL REMOTE CONTROL DEVICE.
Patent assigned to Army,
by Charles D. Roach and Larry M. Hewin.
12 Oct 65 Unclassified patent
Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Remote control systems, Cables-(Mechanical)), (*Cables(Mechanical), Flexible couplings), Tapes, Stainless steel, Nylon coatings, Patents.

The flexible control cable is used for controlling engine throttle, choke valves, switches, valves, louvers and the like. The structure includes a sheath made of nylon and a tape which extends through the sheath and has one end attached to an element to be controlled and the other end to a hand knob. The tape has a flattened cross-section and is preferably made of stainless steel. The sheath has the central bore and four radially disposed bores which act to lower the resistance to movement of the tape.

Patent 3,211,396 Field 13I, 1C

ONE-WAY REEL WITH VISCOUS DRAG.
Patent assigned to Navy,
by Edward J. McQuillen. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Reels, Aerial targets), (*Aerial targets, Towed bodies), Airborne, Viscosity, Drag, Patents.

The one-way reel is for use in the field of air-launched towed targetry. The viscous drag is obtained from a bracking mechanism in the form of a circular disk which rotates in a chamber filled with a silicone oil.

Patent 3,211,465 Field 13F

ROLLING LIQUID TRANSPORTER.
Patent assigned to Army,
by James W. Colvin. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Trailers, Cargo vehicles), (*Cargo vehicles, Liquids), Tires, Towed vehicles, Towing vehicles, Patents.

The transporter is a two-wheeled trailer with a towing tongue and a lunette for attachment to a towing vehicle. It is used for transporting engine fuel or water and other liquids. Liquid is carried in the tires. Each of the two tires has a capacity of 500 gallons of liquid. (Author)

SC-DC-65-1391 Field 13A, 9B
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
UPDATING A COMPUTER AIR-CONDITIONING SYSTEM,
by H. H. Baxter, Jr. Apr 65, 27p Unclassified report
Contract AT(29-1)-789

Descriptors: (*Air conditioning equipment, Computers), (*Computers, Air conditioning equipment).

SC-DC-65-1424 Field 13A, 16A, 15B
CFSTI Prices: HC$2.00 MF$0.50

New Mexico Univ., Albuquerque.
UNDERGROUND PROTECTIVE BUILDINGS,
by J. L. Colp. 1965, 32p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Underground structures, Design), (*Shelters, Construction), (*Launching sites, Design).

SC-TM-64-963 Field 13H, 9A
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
CLEANING METHODS FOR SEMICONDUCTOR AND THIN-FILM TECHNOLOGY,
by J. D. Williams and J. N. Shafer. Aug 64, 29p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Semiconductors, Cleaning), (*Cleaning, Semiconductors), Manufacturing methods.

SC-TM-64-1735 Field 13H
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
PRODUCING SMALL-DIAMETER HOLES WITH A LENGTH-TO-DIAMETER RATIO GREATER THAN 100,
by J. A. Rohrer. Dec 64, 9p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Acrylic resins, Capillary tubes), (*Capillary tubes, Manufacturing methods), Drawing-(Machine processing).

UCRL-7794 Field 13M
CFSTI Prices: HC$2.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
DYNAMIC STRUCTURAL ANALYSIS WITH SHORT TIME HISTORY,
by George L. Henderson. 20 Apr 64, 49p
Contract W-7405-ENG-48
Unclassified report

Descriptors: (*Structures, Mathematical analysis), (*Dynamics, Structures).

UCRL-7922 Field 13L, 14B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
HIGH EXPANSION FOAM FIRE CONTROL SYSTEM FOR GLOVED BOXES,
by C. L. Lindeken and R. D. Taylor. 10 Jun 64, 10p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Fire extinguishers, Laboratory equipment), (*Laboratory equipment, Fire extinguishers), Foams.

Y-JA-18 Field 13A
CFSTI Prices: HC$2.00 MF$0.50

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
COOLING TOWER MAINTENANCE,
by J. R. Demonbrun. 13 Jan 65, 29p
Contract W-7405-eng-26
Unclassified report

Prepared for presentation at the Annual January cooling Tower Institute Meeting, Houston, Texas, 25 Jan 65.

Descriptors: (*Cooling and ventilating, equipment, Industrial equipment), (*Towers, Cooling and ventilating equipment).

Y-OA-21 Field 13D, 11F
CFSTI Prices: HC$1.00 MF$0.50

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
NEW TECHNIQUES FOR OUT-OF-PLANT PACKAGING AND INTERNAL-HANDLING CONTAINERS,
by C. R. Riggs. 21 Aug 64, 23p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Packaging, Expanded plastics), (*Containers, Expanded plastics).

14. Methods and Equipment

N65-17605 Field 14D
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Defense and Space Center, Baltimore, Md. Surface Div.
ANALYSIS AND DEVELOPMENT OF FAILURE-RESPONSIVE SYSTEM ORGANIZATIONS,
Dec 64, 76p Rept. nos. Technical rept. TR-5, WGD-38521
Contract NASw572 Unclassified report
NASA CR-60897

Descriptors: (*Reliability(Electronics), Redundant components), (*Redundant components, Reliability-(Electronics)).

N65-17953 Field 14D, 18H, 9A
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF THE RELIABILITY OF ELECTRONIC COMPONENTS IN A NUCLEAR-RADIATION ENVIRONMENT,
by D. J. Hamman, D. J. Hanks, and C. L. Wyler.
1 Apr 64, 20p Quarterly rept. no. QR-5
Contract NAS7 100
NASA CR-60984; JPL 950458
Unclassified report

Descriptors: (*Electronic equipment, Radiation damage), (*Radiation damage, Electronic equipment), Reliability-(Electronics).

N65-22370 Field 14B, 11F
CFSTI Prices: HC$3.00 MF$0.50

Hydronautics, Inc., Laurel, Md.
CAVITATION DAMAGE IN LIQUID METALS,
Technical progress rept., 20 Apr-31 Dec 64,
by C. E. Couchman, III, H. S. Preiser, and A. Thiruvengadam. 10 Mar 65, 55p TPR-467-1
Contract NAS3 4172 Unclassified report
NASA CR-54332

Descriptors: (*Refractory metal alloys, Cavitation), (*Cavitation, Test facilities), Liquid metals.

N65-25402 Field 14B, 9A
CFSTI Prices: HC$1.00 MF$0.50

TRW Space Technology Labs., Redondo Beach, Calif. Physical Electronics Lab.
SOLID STATE HIGH VOLTAGE PULSER,
by David O. Hansen. 12 Mar 65, 4p
STL-4158-6005-TU-000
Contract NASw 936
NASA CR-63173
Unclassified report

Descriptors: (*Pulse generators, Semiconductor devices), (*Circuits, Pulse generators).

N65-28957 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
CHARACTERISTICS OF ENVIRONMENTAL TEST EQUIPMENT AT THE LANGLEY RESEARCH CENTER,
by Sherman A. Clevenson and Ian O. MacConochie.
Jul 65, 45p NASA-TM-X-1129
Unclassified report

Descriptors: (*Aeronautical laboratories, Test equipment).

NYO-3237-2 Field 14B, 18I
CFSTI Prices: HC$4.00 MF$0.75

Mechanical Technology Inc., Latham, N. Y.
DESIGN, CONSTRUCTION AND CHECKOUT OF A HIGH-TEMPERATURE RESEARCH LOOP FACILITY,
by P. W. Curwen. 17 Mar 65, 114p
MTI-65TR8
Contract AT(30-1)-3237
Unclassified report

Descriptors: (*Gas flow, High-temperature research), (*High-temperature research, Gas flow), (*Gas-cooled reactors, Simulation).

ORNL-TM-1101 Field 14B, 20M
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
CENTRIFUGAL FLOWMETER TESTS,
by W. R. Gambill. 20 Apr 65, 22p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Flowmeters, Tests), (*Heat transfer, Instrumentation).

Patent 3,205,321 Field 14B, 9A

MINIATURE ELECTROLYTIC TIMER WITH AN ERODABLE ANODE.
Patent assigned to Navy,
by Robert J. Lyon. 7 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Timing devices, Electrolytic cells), (*Electrolytic cells, Miniature electrical equipment), Anodes(Electrolytic cell), Erosion, Electric switches, Time-delay relays, Mine components, Guided missile components, Satellites(Artificial), Patents.

The electrolytic timer may be used in missiles, mines and satellites where weight and space are important. It consists of an electrolytic cell for controlling a spring biased plunger between a retracted position and an advanced position, the motion of the plunger from the first to the second position actuating an electric switch. The plunger is restrained in the retracted position by an enlarged portion of an anode element which extends into a chamber containing an electrolyte. When an electric current is passed through the electrolyte, erosion of the anode takes place, and depending on the size of the anode and the magnitude of the current, operation may be delayed for a predetermined time, after which the restraint provided by the anode will be removed to permit the plunger to move forward to the extended position.

Patent 3,205,377 Field 14B

RASTER LINEARITY CORRECTION GENERATOR.
Patent assigned to Navy,
by Lawrence A. Nix, Jr. 7 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Sweep generators, Corrections), Linear systems, Cathode ray tubes, Patents.

The linearity correction generator corrects for non-linearity introduced in wide angle flat-faced cathode ray

deflection systems. The system includes correction matrices formed by a plurality of paralleled biased diodes. A combining network includes four transistors in serial relationship.

Patent 3,208,272 Field 14B

SURFACE ROUGHNESS DETECTOR.
Patent assigned to NASA,
by John B. Hall, Jr., James C. Brady and Staten B. Price. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Meters, Surface properties), Surfaces, Deformation, Electric bridges, Electronic recording systems, Test equipment, Patents.

The surface roughness detector is useful in the fabrication of structural elements, such as precision instrument parts, aerospace vehicle models for testing in wind tunnels, surface panels for aerospace vehicles and the like. Rough spots are determined by employing a normally balanced electric bridge unit electrically connected to suitable electrical circuitry and mechanically connected to a movable carriage unit which is adapted to traverse the surface profile of a specimen, under the guidance of a track and threaded shaft or worm member. A sensing rod or feeler member carried by the carriage unit maintains contact with the specimen surface.

Patent 3,211,531 Field 14B

MINIATURIZED REACTION VESSEL.
Patent assigned to Navy,
by Theodor H. Benzinger. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Containers, Calorimeters), (*Calorimeters, Micrometers), Patents, Capillary tubes, Seals(Stoppers), Mixtures, Separation.

The reaction vessel is for use in the core of a colorimeter of the type wherein only gravitational forces are employed to intermix the reactants. The structure includes a combined cap and interim fluid storage device for the open-ended reaction vessel. The vessel keeps two or three reactants separated during periods of rotation of the vessel. Materials for testing in the vessel include microorganisms, parasites, sperms, virus, tissue slices and the like.

PB-168 459 Field 14E
CFSTI Prices: HC$4.00 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
CONTINUOUS-TONE ELECTROSTATIC ELECTROGRAPHY.
Quarterly progress rept. no. 3, 15 Dec 48-15 Mar 49,
by R. M. Schaffert, D. T. Williams, A. E. Middleton, and L. E. Walkup. 15 Mar 49, 112p
Proj. 195B, 3 99 04 052
AD 67 866

Unclassified report

Available copy will not permit fully legible reproduction. (Subcontract to Haloid Co., Contract W36 039sc36851).

Descriptors: (*Electrophotography, Electrostatics), (*Electrostatics, Electrophotography), Photographic plates, Electrical properties, Selenium, Aluminium, Temperature, Sensitivity, Vacuum, Evaporation, Paints, Photographic filters, Photographic processors, Photoconductivity, Theory, Photoelectric materials.

Contents:
Investigation of physical factors affecting the electrical properties of electrophotographic plates
Experimental work on plate preparation by vacuum evaporation
Preparation and testing of electrophotographic plates made with selenium-containing paints
Improvements in light sources for testing electrophotographic plates
Experimental work on plate-developing techniques
Testing of additional photoconductors
Theory of photoconductivity in electrophotographic plates.

SC-DC-65-1237 Field 14B, 18H
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
MEASUREMENTS OF HIGH TEMPERATURES,
by J. A. Barber. 1965, 30p CONF-650204-7
Contract AT(29-1)-789

Unclassified report

Presented at the meeting on thermocouple technology and the effects of nuclear radiation on thermocouples, Washington, D. C.

Descriptors: (*Radiation damage, Thermocouples), (*Thermocouples, Radiation damage), High temperature research, Measurements.

TID-21667 Field 14B, 20C, 20E, 20F, 20I, 20N, 3A, 17B
CFSTI Prices: HC$7.00 MF$1.75

Research Lab. of Electronics, Massachusetts Inst. of Tech.
QUARTERLY PROGRESS REPORT NO. 76,
by H. J. Zimmermann and G. G. Harvey. 15 Jan 65, 370p
Contract AT(30-1)-1842

Unclassified report

Descriptors: (*Physics, Scientific research), Electronics.

UCRL-7799 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
DEMONSTRATION MODEL OF THE CAUCHOIS SPECTROMETER,
by B. G. Saunders. 31 Mar 64, 9p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Spectrum analyzers, Design).

UCRL-16087 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
REVIEW OF FILM-LESS SPARK CHAMBER TECHNIQUES: ACCOUSTIC AND VIDICON.

by Victor Perez-Mendez. 3 May 65, 17p
CONF-650510-3
Contract W-7405-eng-48

Unclassified report

Prepared for presentation at Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind., May 1965.

Descriptors: (*Vidicons, Test equipment), (*Test equipment, Reviews).

15. Military Sciences

No entries

16. Missile Technology

AD-451 321 Field 16D
CFSTI Prices: HC$3.00

Battelle Memorial Inst., Columbus, Ohio.
LATERAL VIBRATIONS IN MISSILES, A BIBLICGRAPHY,
by L. E. Hurlbert, W. L. Belton, and T. J. Atterbury. Jul 64, 53p
Contract DA01 121AMC2037
RSIC 266

Unclassified report

Descriptors: (*Guided missiles, Vibration), Bibliographies, Damping, Structural properties, Cylindrical bodies, Structural shells.

This bibliography consists of 377 entries, and contains the results of a title survey conducted to obtain literature related to the problem of damping the transverse vibration of large missiles. The titles are grouped into three categories covering free vibrations, damped vibrations, and material damping properties. Only papers published in English after 1940 are included. (Author)

AD-465 784 Field 16D, 11G
CFSTI Price: HC$3.00

Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
PRELIMINARY DESIGN METHODS FOR THE OPTIMIZATION OF INSULATED STRUCTURES FOR HYPERSONIC CRUISE VEHICLES,
by Robert M. Rivello. 15 May 64, 61p
Rept. no. CF-3085
Contract NOw62 0604c

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Cruise missiles, Thermal insulation), (*Guided missiles(Surface-to-air), Thermal insulation), Design, Mathematical analysis, Equations, Optimization, Airframes, Materials, Aerodynamic loading, Aerodynamic heating, Hypersonic flight, Graphite, Zirconium compounds, Dioxides, Beryllium, Titanium alloys, Chromium alloys, Cobalt alloys, Nickel alloys, Magnesium alloys, Molybdenum alloys, Heat-resistant metals + alloys, Laminates.

A simple method for the preliminary design of insulated structures for hypersonic cruise vehicles is presented. The method of analysis is useful in arriving at the optimum combination of insulating and structural materials for a given loading and thermal environment. Techniques are given for structures subjected to one or more sets of design conditions. A method for screening insulating and structural materials to determine those candidate materials which appear to offer the most promise for lightweight hypersonic structures is discussed. From this screening procedure the insulators pyrolytic graphite and zirconium dioxide and the structural metals beryllium, Ti-13V-11Cr-3Al titanium, Rene' 41, HM21A-T81 magnesium, and TZM molybdenum were selected for further study. Optimum design curves for combinations of these materials at exposure temperatures of 3000, 4000, and 5000 F and times of 20 and 60 seconds are given for a wide range of loadings.

N65-15334 Field 16D
CFSTI Prices: HC$3.00 MF$0.75

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
HEAT TRANSFER AND PRESSURE INVESTIGATIONS OF AN SI/S-IV STAGE SEPARATION MODEL USING SHORT-DURATION TECHNIQUES. VOLUME I- INTRODUCTION AND GENERAL METHOD,
by C. L. Matthis. Jun 64, 72p
CAL-HM-1510-Y-11
NAS8 823
NASA CR-60284

Unclassified report

Descriptors: (*Staging, Heat transfer), (*Guided missile simulators, Staging).

Patent 3,208,346 Field 16A

FORWARD FLOTATION MEANS FOR A WATER-LAUNCHABLE MISSILE.
Patent assigned to Navy,
by Salvatore J. Peniza and Alfred B. Carpenter.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missile launchers, Water), Floating bodies, Guided missiles, Firing circuits, Electric switches, Explosive actuators, Locking fastener devices, Patents.

A separable forward-flotation structure is provided for a water-launchable missile which incorporates nonstrechable locking straps and an electrical interlock which controls the firing circuit of the missile. The missile firing circuit is maintained in a de-energized condition until the straps are physically separated and the flotation means unlocked from the missile. This result is achieved by providing 'on-off' switches associated with the straps, which switches are connected in the missile firing circuit. The switches are depressed to an 'off' position by the pressure of the straps. The straps are detachably locked around both the flotation means and the missile by explosive bolts or the like which are remotely controlled by a suitable electrical circuit.

SC-RR-64-1651 Field 16A, 13L
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
LAUNCH ABORT ENVIRONMENT STUDY.
Interim rept.,
by F. D. Kite. Feb 65, 19p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Guided missile safety, Analysis), (*Abort, Launching).

17. Navigation, Communications, Detection, and Countermeasures

N65-16427 Field 17B, 5C
CFSTI Prices: HC$3.00 MF$0.50

Rand Corp., Santa Monica, Calif.
OVERSEAS TELECOMMUNICATIONS TRAFFIC AND COMMODITY TRADE,
by Robert L. Slighton. Sep 63, 58p
Memo. no. RM-3817-NASA
Contract NASR2101
NASA CR-55291

Unclassified report

Descriptors: (*Global communication systems, Commerce), (*Commerce, Global communication systems).

N65-16428 Field 17B
CFSTI Prices: HC$3.00 MF$0.75

Rand Corp., Santa Monica, Calif.
THE MARKET FOR OVERSEAS TELECOMMUNICATIONS IN 1970,
by Robert L. Slighton. Sep 63, 67p
Memo. RM-3831-NASA
Contract NASr2101
NASA CR-55293

Unclassified report

Descriptors: (*Global communication systems, Economics).

N65-16435 Field 17B, 22B
CFSTI Prices: HC$2.00 MF$0.50

Rand Corp., Santa Monica, Calif.
HIGH-CAPACITY SUBMARINE TELEPHONE CABLES: IMPLICATIONS FOR COMMUNICATION SATELLITE RESEARCH AND DEVELOPMENT,
by R. T. Nichols. 30 Sep 63, 47p
Memo. RM-3877-NASA
Contract NASr2101
NASA CR-55290

Unclassified report

Descriptors: (*Underwater communication systems, Multichannel telephone systems), (*Communication satellites(Active), Feasibility studies).

N65-16929 Field 17E
CFSTI Prices: HC$3.00 MF$0.75

Raytheon Co., Norwood, Mass. Communications and Data Processing Operation.
FAST SCAN INFRARED DETECTION AND MEASURING INSTRUMENT.
Rept. on phase 1, 19 Jun 64-15 Jan 65.
15 Jan 65, 95p
Contract NAS8 11604
NASA CR-60711

Unclassified report

Descriptors: (*Infrared detectors, Scanning), (*Infrared radiation, Measurement).

N65-16986 Field 17G
CFSTI Prices: HC$1.00 MF$0.50

Electronic Systems Lab., Mass. Inst. of Tech., Cambridge.
RESEARCH ON VIBRATORY-OUTPUT ANGULAR MOTION SENSORS FIFTH STATUS Rept. no. 5, 1 JUN-30 NOV 63,
by G. C. Newton, Jr. 31 Dec 63, 10p
ESL-SR-189
NSG-149-61
NASA CR-55537

Unclassified report

Descriptors: (*Gyroscopes, Vibration).

N65-23067 Field 17B
CFSTI Prices: HC$1.00 MF$0.50

General Electric Co., Huntsville, Ala. Command Systems Div.
IR TELEVISION SYSTEM FOR FAULT DETECTION. ALTERNATE I--CONTRACT SYSTEM,
by E. G. Butts. 3 Mar 65, 10p
Contract NAS8 11715
NASA CR-62578

Unclassified report

Descriptors: (*Television cameras, Vidicons), (*Infrared radiation, Vidicons).

N65-23207 Field 17G, 22D, 9B
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Teterboro, N. J. Eclipse-Pioneer Div.
REMOTE PROGRAMMABLE POSITION CONTROLLER.
Final rept. May 63-Feb 64,
by Mark Gitlin. 20 Apr 64, 25p
Contract NAS8-5346
NASA CR-62506

Unclassified report

Descriptors: (*Remote control systems, Positioning devices(Machinery)), (*Punched tape, Remote control systems), Guidance, Gimbals.

N65-24995 Field 17B
CFSTI Prices: HC$2.00 MF$0.50

Auburn Univ., Ala. Microwave Research Lab.
DEVELOPMENT OF FM TELEVISION TRANSMITTER. DEVELOPMENT OF RADAR ALTIMETER RETURN PULSE MEASUREMENT SYSTEM. MILLIMETER PROPAGATION STUDY.
Quarterly rept. no. 2, 1 Jun-1 Sep 64,
by H. M. Summer. 1964, 37p
Contract NAS8-11184
NASA CR-62961

Unclassified report

Descriptors: (*Television transmitters, Frequency modulation), (*Radar pulses, Measurement).

Patent 3,205,361 Field 17C, 22B

LIGHT SENSITIVE DIGITAL ASPECT SENSOR.
Patent assigned to NASA,
by James S. Albus. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Direction finding, Solar radiation), (*Spacecraft, Direction finding), Photosensitivity, Telemeter systems, Digital systems, Patents.

The light sensitive digital aspect sensor may be mounted on a satellite of the Vanguard series type. The device

provides a direct binary digital output indicative of the direction of a light source, such as the sun, from the sensor. Light rays penetrate a mask of the sensor to illuminate a photosensitive detecting device. The direct binary digital output is suitable for ready transmission by a pulse code modulated telemetering system.

Patent 3,205,431 Field 17I

ELECTRICAL TRANSDUCER CIRCUIT.
Patent assigned to Navy,
by Kennan C. Herrick, Jr. 7 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Transducer, Circuits), (*Radar targets, Simulation), Patents.

The target voltage generation device is for use in a radar simulator. Electrical transducer circuits are disclosed wherein several electrical output voltages are provided in response to several mechanical inputs so that a selected output voltage represents sequentially the algebraic sum of the mechanical input which is directly associated with the selector output and each other mechanical input. Only one potentiometer is associated with each mechanical input and voltage output.

Patent 3,205,969 Field 17A, 10C, 13G

ENERGY CONVERSION AND POWER AMPLIFICATION SYSTEM.
Patent assigned to Navy,
by Chester A. Clark. 14 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Energy conversion, Underwater sound generators), (*Power amplifiers, Underwater sound generators), Sonar, Hydraulic systems, Underwater equipment, Submarines, Buoys, Patents.

The energy conversion and power amplification system is designed for use deep under the sea, for example, in pulse echo sonar systems, in submarines or underwater unmanned buoy systems. The system includes a hydraulic motor and a sink coupled to output of the motor. The great pressure potential available in deep bodies of water is utilized in the system.

Patent 3,206,684 Field 17I, 9C

DYNAMIC RANGE RATE GENERATOR TESTER.
Patent assigned to Navy,
by Chuck F. Der, Leo J. Hickey and Warren T. O'Reilly.
14 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Radar range calibrators, Test equipment-(Electronics)), (*Test equipment(Electronics), Radar range calibrators), Generators, Coincidence range finding, Radar equipment, Range finding, Timing devices, Patents.

A dynamic range rate generator or calibrator tester is shown which utilizes the pulse output from a marker generator, or the like which produces pulses of a precise and exact pulse repetition rate. Pulses from the marker generator source are compared with the pulses of the range rate generator or calibrator source and these are time compared in a time comparator or coincidence circuit to produce coincidence pulses whenever there is coincidence of the range rate and marker pulses; that is, coincidence pulses occur only upon the simultaneous occurrence of the marker and rate pulses. The coincidence pulses are counted in a counter circuit, such as a binary counter, and the counter produce an output whenever its maximum count is reached. The system includes a skip reset circuit. The output of the counter circuit is applied to a lock-out unit, a memory driver circuit, and an output circuit in sequence to utilize the counter output pulses to produce 'start' and 'stop' output signals for starting and stopping an external timer of time counter.

Patent 3,209,354 Field 17I, 9C

RADAR CLUTTER ELIMINATOR.
Patent assigned to Navy,
by Keefer S. Stull, Jr. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Radar clutter, Suppressors), (*Suppressors, Radar clutter), Doppler radar, Spectrum analyzers, Target discrimination, Radar tracking, Patents.

The method is designed for suppressing clutter in a radar system. A visual indicator is provided for adjusting the setting of a variable frequency oscillator thereby eliminating the presentation of clutter on a radar scope. A spectrum analyzer shows both the clutter and moving targets and has a marker for showing the exact location of the sharp edge of a single-sideband filter.

Patent 3,209,357 Field 17C, 22B

HYPERBOLIC POSITION DETERMINATION.
Patent assigned to Navy,
by Theodore Wyatt. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Position finding, Radar stations), (*Hyperbolic navigation, Reconnaissance satellites), Communication satellites(Passive), Satellite networks, Patents.

The method of hyperbolic reconnaissance may be used in locating a radar station. Two or more satellites are used, each receiving radar signals over the same frequency band and either telemetering the occurrence of signal reception or storing the information, together with precision timing information (such as can be obtained from a satellite-borne stable oscillator), in an appropriate memory or recording system for subsequent read-out. As the satellites orbit, either one or both pass through a substantial angular bearing from the signal source during the time interval in which both of the satellites are within line-of-sight receiving range and mutually receive a common series of signals during this time interval. By identifying the difference in time of receipt of individual signals by each satellite a hyperbolic position determination of the radar site can be accomplished.

Patent 3,211,911 Field 17E, 17C

METHOD AND PHOTOCELL DEVICE FOR OBTAINING LIGHT SOURCE POSITION DATA.

Patent assigned to Navy,
by Justin M. Ruhge. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Optical tracking, Photoelectric cells-(Semiconductor)), (*Photoelectric cells(Semiconductor), Guided missile tracking systems), Position finding, Amplifiers, Oscillators, Mixers(Electronic), Patents.

The photocell device may be used in look-angle indicator systems for missiles. The system is for locating a space oriented source for incident light waves having continuously changing angles of incidence and changing values of intensity. A lateral photocell of the semiconductor type is used in a circuit having two amplifiers, two voltage-controlled subcarrier oscillators, a mixer, and a transmitter.

Patent 3,212,083 Field 17G, 16B

GATING SYSTEM FOR SEMI-ACTIVE MISSILE GUIDANCE WHICH ALLOWS SIGNALS OF PREDETERMINED VELOCITY AND RANGE TO ENTER.
Patent assigned to Navy,
by Walter R. Hinchman. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Range gating, Guided missiles), (*Guidance, Guided missiles), Gates(Circuits), Mixers(Electronic), Doppler systems, Velocity, Frequency modulation, Patents.

The gating system is for semi-active missile guidance. The desired target is gated in both velocity and range. Circuits are provided for generating signals proportional to range and to velocity. A balanced mixer circuit is coupled to the two circuits to produce an output signal when the velocity signal and the range signal coincide. A doppler amplifier is coupled to the mixer and produces an output signal proportional to the closure rate between the target and the guided missile.

Patent 3,212,084 Field 17I, 17G

SYSTEM FOR SIMULTANEOUSLY DISPLAYING A PLURALITY OF RADAR IMAGES IN MORE THAN ONE DIMENSION.
Patent assigned to Navy,
by John B. Garrison. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Stereoscopic display systems, Radar equipment), (*Radar equipment, Stereoscopic display systems), Radar, Radar range computers, Lenses, Search radar, Air traffic control systems, Patents.

The radar simultaneously displays a plurality of radar target images in three dimensions. The system includes a radar, a computer, a high voltage source and a lens system. The three dimensional display is based on optical principles of operation. It may be used in conjunction with sonar to display simultaneously both sub-surface and surface tactical military situations for evaluation. The display can also be used in air traffic systems.

Patent 3,212,089 Field 17I, 17G

MONOPULSE RESOLUTION IMPROVEMENT.
Patent assigned to FAA,
by Andrew Longacre and James D. Rodems.
12 Oct 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Monopulse radar, Resolution), (*Air traffic control systems, Monopulse radar), Antenna lobes, Radar scanning, Target discrimination, Azimuth, Range finding, Radar equipment, Patents.

The simultaneous lobing radar system is utilized in an air traffic control system. Apparatus is disclosed for improving target definition and resolution in such a system. Angular target definition of sufficient accuracy and preciseness in real time is provided to enable introduction into electronic computers and data processing equipment.

18. Nuclear Science and Technology

ACNP-63601 Field 18I, 18L
CFSTI Prices: HC$1.00 MF$0.50

Allis-Chalmers Mfg. Co., Milwaukee, Wis. Atomic Energy Div.
LARGE FAST-REACTOR DESIGN STUDY.
Monthly rept.
Sep 63, 10p
Contract AT(11-1)-1316

Unclassified report

Prepared in cooperation with Atomic Power Development Associates, Inc., Detroit, Mich., and Babcock and Wilcox Co., Lynchburg, Va. Atomic Energy Div.

Descriptors: (*Fast reactors, Design), Reactor theory.

ACNP-63602 Field 18I, 18L
CFSTI Prices: HC$1.00 MF$0.50

Allis-Chalmers Mfg. Co., Milwaukee, Wis. Atomic Energy Div.
LARGE FAST-REACTOR DESIGN STUDY.
Monthly rept.
Oct 63, 7p
Contract AT(11-1)-1316

Unclassified report

Descriptors: (*Fast reactors, Design).

AD-418 103 Field 18H
CFSTI Price: HC$1.00

Hughes Aircraft Co., Fullerton, Calif. Nucleonics Div.
TRANSIENT RADIATION EFFECTS IN PASSIVE PARTS.
Quarterly progress rept. no. 4, 1 Mar-31 May 63,
by C. W. Perkins and R. E. Bailey. 31 May 63, 25p
Rept. no. FR63-17-202
Contract DA36 039SC89112

Unclassified report

Descriptors: (*Radiation damage, Electronic equipment), (*Coaxial cables, Radiation damage), (*Resistors, Radiation damage), (*Capacitors, Radiation damage), Resistance(Electrical), Electrical properties.

The tests covered the following areas of investigation: Coaxial cable tests, Resistor tests, d.c. capacitor tests, and a.c. capacitor tests. Discrepancies with previous tests were observed in the coaxial cable tests. These were greater fluctuations in responses and apparently increased cross-over voltage which were attributed chiefly to the physical condition of the cables and to their previous history of radiation and voltage. The resistor tests revealed only the effects of the cables and demonstrate that the internal effects on resistors are exceedingly small as to be expected on the basis of their internal capacitance, (See First Quarterly Report for discussion of this). The d.c. capacitor tests demonstrate the usefulness of the system for measurements on capacitors. Leakage resistances in 0.01 microfarad capacitors are found to be 10 megohms in ceramic disc types, 1.2 megohms in Vitamin Q types, and 0.8 megohms in oil-paper type in the SPRF environment. The a.c. capacitor tests continue to be plagued with problems. The results are at variance with calibration curves. The system will be examined in detail and laboratory calibration procedures improved before further irradiation tests are undertaken.

AP-NOTE-399 Field 18E
CFSTI Prices: HC$2.00 MF$0.50

Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
CONTROL ROD PROGRAMMING. PART II. TWO GROUP THEORY OF GENERAL CONFIGURATION,
by R. L. Murray. 20 Jun 62, 30p
Contract AT(30-1)-2639

Unclassified report

Prepared in Cooperation with North Carolina State College.

Descriptors: (*Control rods, Configuration).

BMI-1729 Field 18J, 11B, 18H
CFSTI Prices: HC$0.50 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
IRRADIATION EVALUATION OF AL2O3-COATED UO2 FUEL PARTICLES,
by Neil E. Miller, Robert L. Ritzman and Robert L. Martin. 16 Jun 65, 22p
Contract W-7405-eng-92

Unclassified report

Descriptors: (*Ceramic coatings, Reactor fuels), (*Reactor fuels, Radiation damage), Oxides, Aluminum compounds.

BMI-X-10129 Field 18J, 11F
CFSTI Prices: HC$4.00 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
SODIUM TECHNOLOGY SUPPORT PROGRAM FOR PACIFIC NORTHWEST LABORATORIES, BATTELLE MEMORIAL INSTITUTE FFTF STUDIES, FY 1965,
by Eugene M. Simons, John H. Stang, Sam J. Basham, William A. Glaeser, and J. Clarence Bell. 9 Jul 65, 101p
Contract W-7405-eng-92

Unclassified report

Descriptors: (*Liquid metal cooled reactors, Sodium), (*Corrosion-resistant alloys, Reactor materials), (*Corrosion, Liquid metals).

BNL-889 Field 18H, 20H, 7E
CFSTI Prices: HC$6.00 MF$1.25

Brookhaven National Lab., Upton, N. Y.
COMPUTATIONAL METHODS OF GAMMA IRRADIATOR DESIGN,
by B. Manowitz, R. H. Bretton, L. Galanter, and F. X. Rizzo. Dec 64, 209p BNL-T-361
Contract AT30 2GEN16

Unclassified report

Descriptors: (*Gamma rays, Sources).

BNL-8186 Field 18J, 20M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
HEAT TRANSFER IN PARALLEL-PLATE CHANNEL WITH PERIODIC BOUNDARY CONDITIONS,
by Chia-Jung Hsu. 18 May 64, 17p
Contract AT30 2GEN16

Unclassified report

Descriptors: (*Heat transfer, Reactor fuel plates), (*Reactor fuel plates, Heat transfer).

BNL-8222 Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
INTERSTITIAL REACTIONS IN GRAPHITE DURING NEUTRON REIRRADIATIONS. I. STEADY STATE CONSECUTIVE REACTIONS,
by Donald G. Schweitzer. 1964, 21p
Contract AT-30-2-GEN-16

Unclassified report

Descriptors: (*Graphite, Radiation damage), (*Radiation damage, Graphite), Impurities.

BNL-8223 Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
INTERSTITIAL REACTORS IN GRAPHITE DURING NEUTRON REIRRADIATIONS. II. NON-STEADY STATE CONSECUTIVE REACTIONS,
by Donald G. Schweitzer. 1963, 28p
Contract AT-30-2-GEN-16

Unclassified report

Descriptors: (*Graphite, Radiation damage), (*Radiation damage, Graphite).

BNL-8909 Field 18B
CFSTI Prices: HC$3.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
FOUR LECTURES ON ISOTOPE PRODUCTION AND UTILIZATION. I. PRACTICAL CONSIDERATIONS IN APPLYING RADIOCHEMISTRY AND NUCLEAR CHEMISTRY. II. PRODUCTION OF SPECIAL RADIOISOTOPES, GENERAL. III. PRODUCTION OF SPECIAL RADIOISOTOPES, DETAILS. IV. THE PEACEFUL (NON-POWER) APPLICATIONS OF ATOMIC ENERGY,
by Louis G. Stang, Jr. 1964, 82p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Radioactive isotopes, Production), (*Nuclear industrial applications, Radioactive isotopes), Labeled substances.

BNL-9003 Field 18I, 18J
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.

SETTLED BED FAST REACTOR CONCEPT. STATUS REPORT,
by C. Raseman, J. Chernick, and L. P. Hatch.
25 Feb 65, 7p CONF-650602-21
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the American Nuclear Society 11th Annual Meeting, Gatlinburg, Tenn.

Descriptors: (*Research reactors, Fast reactors), (*Fast reactors, Research reactors), Reactor fuels, Spheres.

BNWL-62 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
AERIAL AND GROUND GAMMA SURVEY MONITORS.
by L. D. Philipp and E. M. Sheen. May 65, 16p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Gamma counters, Radiation monitors), (*Radiation monitors, Gamma counters), Airborne.

BNWL-84 Field 18K
CFSTI Prices: HC$3.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
CRUNCH -- A GROUP COLLAPSING CODE FOR FAST REACTOR ANALYSIS,
by W. W. Little, Jr. and R. W. Hardie. 29 Apr 65, 52p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Fast reactors, Programming(Computers)), (*Programming(Computers), Fast reactors).

BNWL-113-5 Field 18J, 18I, 18K, 18L, 7A, 7B, 7E, 6R, 11F
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PLUTONIUM ABSTRACTS. VOLUME 5, NUMBER 5.
30 Jun 65, 40p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Plutonium, Abstracting).

COO-651-12 Field 18L
CFSTI Prices: HC$2.00 MF$0.75

Rural Cooperative Power Association, Elk River, Minn.
ELK RIVER REACTOR.
Monthly operating rept. no. 28, 5, Feb 65, 33p
Contract AT(11-1)-651
Unclassified report

Descriptors: (*Reactor operation, Power reactors), (*Power reactors, Reactor operation), Reports.

COO-651-13 Field 18L
CFSTI Prices: HC$2.00 MF$0.50

Rural Cooperative Power Assn., Elk River, Minn.
ELK RIVER REACTOR.
Monthly operating rept. no. 29, Mar 65, 28p
Contract AT(11-1)-651
Unclassified report

Descriptors: (*Reactor operation, Power reactors), (*Power reactor, Reactor operation).

COO-652-14 Field 18L
CFSTI Prices: HC$2.00 MF$0.50

Piqua Nuclear Power Facility, Ohio.
PIQUA NUCLEAR POWER FACILITY MONTHLY OPERATING REPORT NO. 24.
Apr 65, 29p
Contract AT(11-1)-652
Unclassified report

Descriptors: (*Reactor operation, Power reactors), (*Power reactors, Reactor operation).

CVNA-220 Field 18L
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
REACTOR RESPONSE ANALYSIS BY LOAD CHANGES WITH AND WITHOUT AUTOMATIC CONTROL,
by J. J. Loving. Feb 65, 30p
Contract AT(30-1)-2289
Unclassified report

Descriptors: (*Power reactors, Control systems).

CVNA-234 Field 18L
CFSTI Prices: HC$2.00 MF$0.50

Carolinas Virginia Nuclear Power Associates, Inc., Parr, S. C.
MONTHLY OPERATING REPT.
Apr 65, 30p
Contract AT(30-1)-2289
Unclassified report

Descriptors: (*Reactor operation, Power reactors), (*Power reactors, Reactor operation), Reports.

EGG-1183-2016 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Edgerton, Germeshausen and Grier, Inc., Santa Barbara, Calif.
THERMOLUMINESCENT DOSIMETER AS THE GAMMA COMPONENT OF A NUCLEAR ACCIDENT DOSIMETER,
by John S. Handloser. 1965, 15p
CONF-650302-4, SM-56-10
Contract AT(29-1)-1183
Unclassified report

Presented at IAEA Symposium on Personnel Dosimetry for Accidental High-Level Exposure to External and Internal radiation, Vienna, 8-12 Mar 1965.

Descriptors: (*Dosimeters, Gamma rays), (*Gamma counters, Dosimeters).

EURAEC-1347 Field 18H
CFSTI Prices: HC$2.00 MF$0.50

Societa Ricerche Impienti Nucleari, Sluggia (Italy). Centro Ricerche Nucleari.

ON THE EFFECT OF NITROGEN INTERSTITIALS ON THE RADIATION EMBRITTLEMENT OF PURE IRON.
Technical rept. no. 3,
by M. Castagna, R. L. Colombo, and A. Ferro.
Mar 65, 37p EUR-2322
Contract 004-63-10-TEEI

Unclassified report

Descriptors: (*Iron, Radiation damage), (*Radiation damage, Iron), Impurities, Nitrogen, Brittleness.

EURAEC-1394 Field 18H, 18J
CFSTI Prices: HC$3.00 MF$0.50

Battelle Memorial Inst., Geneva (Switzerland).
THE EFFECT OF RADIATION ON THE DUCTILE-BRITTLE TRANSITION IN PRESSURE VESSEL STEELS.
Final rept. for 15 Dec 60-31 Jan 65,
by E. Anderson, W. Bollmann, D. G. Brandon, D. L. King, and J. Spreadborough. May 65, 52p EUR-2354
Contract 095-82-12 RDS

Unclassified report

Descriptors: (*Steel, Radiation damage), (*Radiation damage, Steel), Pressure vessels, Brittleness, Reactor materials.

GA-5537 Field 18M
CFSTI Prices: HC$6.00 MF$1.50

General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
A STUDY OF A GAS-COOLED FAST BREEDER REACTOR. INITIAL STUDY: CORE DESIGN ANALYSIS AND SYSTEM DEVELOPMENT PROGRAM.
Final summary rept.
15 Aug 64, 272p Unclassified report
Contract AT(04-3)-167

Descriptors: (*Gas-cooled reactors, Breeder reactors), (*Breeder reactors, Fast reactors).

HW-81250A Field 18H, 7D
CFSTI Prices: HC$4.00 MF$1.00

Richland, Wash. Hanford Atomic Products Operation, Richland, Wash.
THE H-4, H-5, AND H-6 IRRADIATION EXPERIMENTS IRRADIATION OF N-REACTOR GRAPHITE.
Interim rept. no. 1,
by J. W. Helm. Oct 64, 107p
Contract AT(45-1)-1350

Unclassified report

Descriptors: (*Nuclear reactors, Graphite), (*Graphite, Radiation damage).

IDO-17058 Field 18F, 18N
CFSTI Prices: HC$4.00 MF$0.75

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
STEP PROJECT.
Quarterly technical rept., Oct-Dec 63,
by E. R. Oetken. Mar 65, 122p Unclassified report
Contract AT(10-1)-205

Descriptors: (*Reactor safety systems, Nuclear power plants), (*Nuclear power plants, Spacecraft).

MIT-2249-2 Field 18B
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.

DEUTERIUM SEPARATION BY AMMONIA DISTILLATION AND HYDROGEN-WATER EXCHANGE.
Final rept.,
by Manson Benedict. 15 Jan 65, 8p MITNE-56
Contract AT(30-1)-2249

Unclassified report

Descriptors: (*Deuterium, Isotope separation), (*Isotope separation, Exchange reactions).

N65-17270 Field 18N, 13K
CFSTI Prices: HC$4.00 MF$0.75

Von Karman Center, Aerojet-General Corp., Azusa, Calif.
SNAP-8 SEALS-TO-SPACE DEVELOPMENT TEST PROGRAM. VOLUME I- VISCO PUMP,
by R. L. Lessley. May 64, 118p
Rept. no. 2808, Vol. 1
Contract NAS5-417
NASA CR-54234

Unclassified report

Descriptors: (*Pumps, Nuclear power plants), (*Nuclear power plants, Spacecraft).

N65-25593 Field 18H, 20L
CFSTI Prices: HC$1.00 MF$0.50

Old Dominion Coll., Norfolk, Va. Dept. of Physics.
DEFECT ANNEALING IN IRRADIATED SEMICONDUCTORS.
Progress rept. no. 2, 1 Oct 64-31 Mar 65,
by W. Maurice Pritchard. 1 Apr 65, 13p CSCL-20
Grant NsG 602
NASA CR-63253

Unclassified report

Descriptors: (*Semiconductors, Radiation damage), (*Radiation damage, Semiconductors).

NMI-7262 Field 18J, 13H
CFSTI Prices: HC$2.00 MF$0.75

Nuclear Metals, West Concord, Mass.
DEVELOPMENT OF FABRICATION PROCESSES FOR CONCENTRIC DRIVER TUBES FOR THE HWCTR,
by S. Isserow, D. M. Davies, W. J. Richmond, A. B. Bremer, and T. A. Tarpey. 4 Sep 64, 56p
Contract AT(30-1)-1565

Unclassified report

Descriptors: (*Pipes, Reactor fuels), (*Extrusion, Pipes).

ORNL-P-160 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
MODIFICATION OF A 400-CHANNEL PULSE-HEIGHT ANALYZER TO ELIMINATE STORAGE OF PULSES HAVING ENERGIES BELOW A PRESET BIAS,
by H. A. Todd and T. A. Love. 1964, 5p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Pulse height analyzers, Trigger circuits), (*Trigger circuits, Pulse height analyzers).

ORNL-P-1089 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.

ABSOLUTE ENERGY CALIBRATION OF SOLID STATE DETECTORS FOR FISSION FRAGMENTS AND HEAVY IONS,
by H. W. Schmitt, W. M. Gibson, and J. H. Neiler.
1965, 19p CONF-650301-11
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Pulse height analyzers, Calibration), (*Fission products, Monitors), (*Ions, Monitors).

ORNL-P-1110 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
RECENT DEVELOPMENTS IN THE PROTON-RECOIL SCINTILLATION NEUTRON SPECTROMETER,
by W. R. Burris, and V. V. Verbinski. 1964, 38p
CONF-654-89
Contract W-7405-eng-26
Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, Nov-Dec 1964.

Descriptors: (*Neutron detectors, Proton reactions), (*Spectrum analyzers, Neutron spectrum).

ORNL-P-1167 Field 18K, 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
PULSED-NEUTRON MEASUREMENT OF THE DIFFUSION PARAMETERS IN ORDINARY ICE AS A FUNCTION OF TEMPERATURE,
by Ernest Gerard Silver. 1964, 19p CONF-650504-4
Contract W-7405-eng-26
Unclassified report

Presented at the IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Germany.

Descriptors: (*Diffusion, Ice), (*Neutron transport theory, Ice).

ORNL-P-1235 Field 18I, 18D, 9B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
COMPUTATIONAL PROBLEMS OF REACTOR SAFETY,
by W. K. Ergen. 1964, 13p CONF-650501-10
Contract W-7405-eng-26
Unclassified report

Prepared for presentation at the Conference on Application of Computing Methods to Reactor Problems, Argonne National Lab., Ill., 17-19 May 1965.

Descriptors: (*Reactor operation, Programming-(Computers)), (*Reactor safety systems, Programming(Computers)).

ORNL-TM-733 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
MSRE DESIGN AND OPERATIONS REPORT, PART VI, OPERATING SAFETY LIMITS FOR THE MOLTEN-SALT REACTOR EXPERIMENT,
by S. E. Beall and R. H. Guymon. 1964, 5p
Contract W-7405-eng-26 Unclassified report

Descriptors: (*Fused salts cooled reactors, Reactor safety systems), (*Reactor safety systems, Fused salts cooled reactors).

ORNL-TM-909 Field 18I, 18D
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
MSRE DESIGN AND OPERATIONS REPORT. PART IX. SAFETY PROCEDURES AND EMERGENCY PLANS,
by A. N. Smith. Jun 65, 58p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor safety systems, Design).

ORNL-TM-1057 Field 18E
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
ESTIMATION OF ANNUAL OPERATING AND MAINTENANCE COSTS OF DUAL-PURPOSE NUCLEAR-ELECTRIC SEA WATER CONVERSION STATIONS,
by S. A. Reed and J. C. Moyers. Apr 65, 12p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear industrial applications, Desalination), (*Desalination, Nuclear industrial applications).

ORNL-TM-1079 Field 18I, 18M
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
OAK RIDGE RESEARCH REACTOR.
Quarterly rept., Oct-Dec 64,
by W. R. Casto and W. H. Tabor. 12 Mar 65, 28p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Research reactor, Reactor operation).

ORNL-TM-1087 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
MEASURED NEUTRON SOURCE SPECTRA FOR ANGULAR SCATTERING EXPERIMENTS WITH SMALL CYLINDERS,
by J. C. Courtney, and V. V. Verbinski. 9 Apr 65, 11p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Fast neutrons, Scattering), (*Cylindrical bodies, Fast neutrons).

ORNL-TM-1095 Field 18J
CFSTI Prices: HC$2.00 MF$0.75

Oak Ridge National Lab., Tenn.
FABRICATION AND PREIRRADIATION DATA OF HFIR TARGET ELEMENTS FOR SAVANNAH RIVER IRRADIATIONS,
by J. D. Sease. Jun 65, 50p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor fuel elements, Production), (*Breeder reactors, Reactor fuel elements).

ORNL-TM-1115 Field 18J
CFSTI Prices: HC$2.00 MF$0.75

Oak Ridge National Lab., Tenn.
REFABRICATION TECHNOLOGY AND COSTS FOR HIGH-TEMPERATURE GAS-COOLED REACTOR FUELS,
by A. L. Lotts, D. A. Douglas, Jr. and R. L. Pilloton.
May 65, 49p CONF-650606-4
Contract W-7405-eng-26

Unclassified report

Prepared for presentation at Euratom Symposium on Fuel Cycles of High-Temperature Gas-Cooled Reactors, Brussels, Belgium, 10-11 Jun 1965.

Descriptors: (*Reactor fuels, Gas-cooled reactors), (*Reactor fuel processing, Gas-cooled reactors).

ORNL-TM-1123 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
FABRICATION VARIABLES, PERFORMANCE, AND COST CONSIDERATIONS FOR HTGR COATED-PARTICLE FUELS,
by W. O. Harms and D. B. Trauger. 30 Apr 65, 31p
CONF-650606-5
Contract W-7405-eng-26

Unclassified report

Prepared for presentation at Euratom Symposium on Fuel Cycles of High-Temperature Gas-Cooled Reactors, Brussels, Belgium, 10-11 Jun 65.

Descriptors: (*Reactor fuels, Gas-cooled reactors), (*Reactor fuel cladding, Refractory coatings), Reactor fuel processing.

ORNL-TM-1139 Field 18J
CFSTI Prices: HC$2.00 MF$0.75

Oak Ridge National Lab., Tenn.
REPROCESSING METHODS AND COSTS FOR SELECTED THORIUM-BEARING REACTOR FUEL TYPES,
by J. T. Roberts, L. M. Ferris, E. L. Nicholson, R. H. Rainey, and C. D. Watson. 14 May 65, 50p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor fuel processing, Power reactors), (*Thorium, Reactor fuels).

ORNL-TM-1141 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
REFABRICATION TECHNOLOGY FOR THE THORIUM - URANIUM-233 FUEL CYCLE,
by A. L. Lotts and D. A. Douglas, Jr. 1965, 52p
CONF-650615-1
Contract W-7405-eng-26

Unclassified report

Prepared for presentation at IAEA Panel on Utilization of Thorium in Power Reactors, Vienna, Austria, 14-18 Jun 65.

Descriptors: (*Reactor fuels, Gas-cooled reactors), (*Reactor fuel processing, Gas-cooled reactors), Thorium alloys, Uranium alloys.

Patent 3,208,159 Field 18D

SIMULATED RADIATION DETECTOR.
Patent assigned to Navy,
by Alexander M. Filipov. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Radiation measurement systems, Simulation), (*Training devices, Radiation measurement systems), Patents, Optical equipment, Simulators.

The simulated radiation detector is used in training individuals in the detection of radioactive materials. An optical system, including a lens, is used to focus a primary source of radiation, having a first frequency, on a contaminant and this is refracted toward several reflecting surfaces. On of these surfaces is adapted to be moved toward the other thereby varying the effective range of the optical system. These reflecting surfaces in turn direct the incident refracted secondary radiation toward a detector, which is capable of detecting the secondary radiation.

Patent 3,208,817 Field 18J, 11F

METHOD OF DISSOLVING PLUTONIUM WITH SULFAMIC ACID.
Patent assigned to AEC,
by William J. Jenkins. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Plutonium, Solutions), (*Sulfamic acids, Solutions), Reactor fuel processing, Solvent extraction, Containers, Stainless steel, Nitric acid, Patents.

The dissolution of plutonium metal is required in various nuclear fuel processes, for example, as a preliminary step to solvent extraction. Plutonium metal is contacted with aqueous sulfamic acid in a stainless steel container until dissolution. The contacting mixture is dept at below 50 degrees C.

Patent 3,209,042 Field 18J, 7C

TREATMENT OF POLYPHENYLS.
Patent assigned to AEC,
by Daniel A. Scola and Robert J. Wineman.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor coolants, Polycyclic compounds), (*Reactor moderators, Polycyclic compounds), (*Polycyclic compounds, Processing), Wastes(Industrial), Organic cooled reactors, Catalysts, Organic solvents, Aromatic compounds, Patents.

The polyphenyls are used as coolants in nuclear reactors. The process is utilized for reclaiming the polyphenyls for reuse as coolants. A mixture of polyphenyls is contacted with hydrogen in the presence of a catalyst such as chromia-alumina at from 300 to 600 degrees C. and a pressure of 200 to 1800 p.s.i.g. The product has a lower average molecular weight and a lower viscosity than that of the mixture.

Patent 3,211,628 Field 18J, 11F

COATED METALLIC URANIUM ARTICLE AND METHOD OF MAKING.

Patent assigned to AEC,
by Lowell D. Eubank. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Uranium, Aluminum coatings), (*Aluminum coatings, Uranium), (*Protective treatments, Uranium), Aluminum alloys, Silicon alloys, Patents, Corrosion inhibition, Coatings, Processing, Reactor materials, Bonding.

The metallic uranium rod is used in a nuclear reactor. An aluminum sheath is bonded to the uranium by an intermediate bonding alloy of aluminum and silicon. The alloy consists of from 5 to 20 percent by weight of silicon and 95 to 80 percent of aluminum.

RFP-115 Field 18G, 18J, 7A
CFSTI Prices: HC$3.00 MF$0.75

Rocky Flats Plant, Dow Chemical Co., Denver, Colo.
EXTRACTION OF URANIUM FROM INCINERATOR ASH LEACH SOLUTIONS,
by J. C. Biery. 10 Jul 58, 93p
Contract AT(29-1)-1106
Unclassified report

Descriptors: (*Radioactive waste, Processing), (*Uranium, Separation).

SCNC-308 Field 18J, 13H
CFSTI Prices: HC$3.00 MF$0.75

Sylvania-Corning Nuclear Corp., Bayside, N. Y.
ANP DEVELOPMENT.
Quarterly progress rept. for period ending 31 Mar 60, May 60, 61p
Contract AT(30-1)-366
Unclassified report

Descriptors: (*Reactor fuel cladding, Niobium alloys), (*Niobium alloys, Reactor fuel cladding), Processing, Tests.

SC-RR-65-224 Field 18H, 9A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
REDUCTION OF 600 2N1051 TRANSISTORS TO A SPECIFIED GAIN BY NEUTRON BOMBARDMENT,
by C. M. Tapp and A. R. Phillips. Jun 65, 11p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Transistors, Neutron reactions), (*Neutron reactions, Transistors), Radiation damage.

SC-TM-261-63(14) Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DEGRADATION OF NPN SILICON PLANAR TRANSISTORS WITH BOMBARDMENT BY HIGH-ENERGY NEUTRONS,
by J. A. Hood. Oct 63, 17p Unclassified report
Contract AT(29-1)-789
Descriptors: (*Radiation damage, Transistors), (*Transistors, Radiation damage), Silicon, Neutron reactors.

SRO-113 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Savannah River Operations Office (AEC), Aiken, S. C.
HEAVY WATER POWER REACTOR PROGRAM.
Monthly progress rept.
19 Feb 65, 10p
Unclassified report

Descriptors: (*Heavy water reactors, Design), (*Power reactors, Design).

SRO-115 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Savannah River Operations Office (AEC), Aiken, S. C.
HEAVY WATER POWER REACTOR PROGRAM.
Monthly progress rept. Unclassified report
Apr 65, 11p
Descriptors: (*Heavy water reactors, Design), (*Power reactors, Design).

TID-21213 Field 18D, 9A
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Elmira, N. Y. Electronic Tube Div.
DEVELOPMENT OF A HIGH SPEED PHOTOMULTIPLIER.
Progress rept., 2 Jan-2 Jul 64,
by G. R. Feaster, L. D. Owen, G. W. Goetze, and S. J. Cherry. 2 Jul 64, 20p
Contract AT(30-1)-2825
Unclassified report

Descriptors: (*Photomultipliers, Manufacturing methods).

TID-21777 Field 18H
CFSTI Prices: HC$2.00 MF$0.50

Union Carbide Corp., Parma, Ohio. Research Lab.
EFFECTS OF NEUTRON DAMAGE ON THE MECHANICAL PROPERTIES OF PYROLYTIC AND SINGLE-CRYSTAL GRAPHITE.
Quarterly progress rept. no. 2, 1 Jul-30 Sep 64,
by J. T. Meers. Oct 64, 46p
Contract AT(40-1)-3237
Unclassified report

Descriptors: (*Radiation damage, Graphite), (*Graphite, Radiation damage), (*Pyrolytic graphite, Radiation damage), Single crystals.

TID-21785 Field 18I, 18L
CFSTI Prices: HC$3.00 MF$0.75

Consumers Public Power District, Hallam, Nebr.
HALLAM NUCLEAR POWER FACILITY.
Monthly operating rept. no. 30, Jan 65,
ed. by R. H. Davidson and I. O. Sunderman. Jan 65, 90p
Contract AT(11-1)-513
Unclassified report

Descriptors: (*Power reactors, Reactor operation), (*Reactor operation, Power reactors).

TID-21793 Field 18L, 18K
CFSTI Prices: HC$1.00 MF$0.50

Institutt for Atomenergi, Kjeller (Norway).
NORA PROJECT PROGRAMME REVIEW, 1965,
Mar 65, 13p NC-65
Contract AT(30-1)-2466
Unclassified report

Descriptors: (*Power reactors, Design), (*Boiling water reactors, Design).

TID-21794 Field 18L, 18I
CFSTI Prices: HC$1.00 MF$0.50

Institutt for atomenergi, Kjeller (Norway).
NORA PROJECT.
Progress rept. for Jul 64 - Mar 65,
Mar 65, 25p NC-64
Contract AT(30-1)-2464

Unclassified report

Descriptors: (*Power reactors, Reaction operation), (*Reactor lattice parameters, Power reactors).

TID-21815 Field 18H, 20H
CFSTI Prices: HC$1.00 MF$0.50

Randall (Harrison M.) Lab. of Physics, Univ. of Michigan, Ann Arbor.
HIGHER ORDER EFFECTS IN THE ALLOWED BETA DECAY OF MN 56,
by H. J. Fischbeck and W. M. Greenberg. 1964, 8p
Contract AT(11-1)-1112

Unclassified report

Descriptors: (*Beta decay, Manganese), (*Manganese, Beta decay).

TID-21829 Field 18D, 20H
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
PRELIMINARY RESULTS USING A GERMANIUM LITHIUM DRIFTED DIODE FOR GAMMA-RAY SPECTROSCOPY,
by J. J. Reidy. 1965, 14p
Contract AT(11-1)-1112

Unclassified report

Descriptors: (*Gamma-ray spectroscopy, Instrumentation).

TID-21830 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Michigan Univ., Ann Arbor. Dept. of Physics.
PRECISION MEASUREMENTS OF GAMMA-RAY ENERGIES UP TO 2 MEV USING A 2-METER CURVED-CRYSTAL MONOCHROMATOR,
by J. J. Reidy and M. L. Wiedenbeck. 1965, 37p
Contract AT(11-1)-1112

Unclassified report

Descriptors: (*Gamma rays, Radiation measurement systems), (*Radiation measurement systems, Gamma rays).

TID-21846 Field 18L, 20M
CFSTI Prices: HC$3.00 MF$0.75

Columbia Univ., New York. Engineering Research Labs.
USAEC/AECL COOPERATIVE PROGRAM ON HEAVY WATER MODERATED POWER REACTORS. SECOND EXPERIMENTAL STUDY OF DRYOUT IN A LONG VERTICAL TUBE WITH A COSINE HEAT FLUX.
Topical rept. no. 5,
by J. E. Casterline. 26 Feb 65, 52p
Contract AT(30-3)-187

Unclassified report

Descriptors: (*Power reactors, Heat transfer), (*Heat transfer, Power reactors).

TID-21860(SUMM.) Field 18I
CFSTI Prices: HC$3.00 MF$0.75

Florida Univ., Gainesville. Dept. of Nuclear Engineering.
'MEASUREMENT OF REACTOR SHUTDOWN MARGIN BY CORRELATION TECHNIQUES.'
Summary rept.,
by Robert E. Uhrig. May 65, 83p
Contract AT(40-1)-3067

Unclassified report

Descriptors: (*Reactor shutdown, Theory), (*Correlation techniques, Reactor shutdown).

UCRL-11199 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
A LOW-COST PERSONAL RADIATION MONITOR,
by Henry S. Dakin. 29 May 64, 22p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Radiation monitors, Safety devices), (*Sound signals, Radiation monitors), Portable.

UCRL-11999 Field 18D, 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE USE OF A LARGE PHOTODIGITAL MASS STORE FOR BUBBLE CHAMBER ANALYSIS,
by Margaret H. Alston and Samuel J. Penny.
May 65, 11p CONF-650510-2
Contract W-7405-eng-48

Unclassified report

Presented at the Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind.

Descriptors: (*Bubble chambers, Data storage systems), (*Data storage systems, Bubble chambers).

UCRL-12407 Field 18H, 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
NEUTRON-INDUCED ACTIVITY IN EARTH AND SEA-WATER FROM BURIED AND SURFACE NEUTRON SOURCES,
by Richard M. Lessler and Frank W. Guy.
9 Apr 65, 62p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Neutron activation, Geophysics).

UNC-5064 Field 18K, 20H
CFSTI Prices: HC$4.00 MF$1.00

United Nuclear Corp., White Plains, N. Y. Development Div.
GENERAL METHODS AND GRAPHS FOR EVALUATION OF EFFECTIVE CROSS SECTIONS USED IN DOPPLER EFFECT CALCULATIONS FOR FAST REACTORS,
by Charles C. Graves. May 64, 101p
Contract AT(30-1)-2832

Unclassified report

Descriptors: (*Doppler effect, Fast reactors), (*Neutron cross sections, Numerical analysis).

UNC-5095 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

United Nuclear Corp., White Plains, N. Y. Development Div.
FUEL CLAD SELECTION FOR CONNECTICUT YANKEE, CORE I,
by R. Holdan, L. Joseph, and M. Laber. 31 Aug 64, 60p
Contract AT(30-1)-3250, Proj. 2328
Unclassified report

Descriptors: (*Reactor fuel cladding, Stainless steel), (*Zirconium alloys, Reactor fuel cladding), (*Stainless steel, Reactor fuel cladding).

UNC-5112 Field 18K
CFSTI Prices: HC$2.00 MF$0.50

United Nuclear Corp., White Plains, N. Y. Development Div.
EFFECT OF RESONANCE OVERLAP ON THE DOPPLER COEFFICIENT FOR LARGE FAST REACTORS,
by C. C. Graves. Dec 64, 46p
Contract AT(30-1)-2832
Unclassified report

Descriptors: (*Fast reactors, Doppler effect), (*Reactor safety systems, Fast reactors).

WAPD-LPR-154 Field 18L, 18K
CFSTI Prices: HC$5.00 MF$1.25

Bettis Atomic Power Lab., Pittsburgh, Pa.
LARGE POWER REACTOR PROGRAM. SUPPLEMENT. THE DESIGN OF SEED-BLANKET CORES.
Interim rept.
Jul 63, 191p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Power reactors, Reactor cores), (*Reactor cores, Power reactors).

WAPD-LSBR-300 Field 18L, 18I
CFSTI Prices: HC$2.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
PERFORMANCE POTENTIAL OF LARGE SEED-BLANKET BREEDER REACTORS.
Feb 65, 43p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Breeder reactors, Reactor operation), (*Reactor operation, Breeder reactors).

WAPD-SC-501(DEL). Field 18F
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
PWR CORE 2 SAFETY ANALYSIS,
Jun 64, 76p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Radiation hazards, Reactor safety systems), (*Reactor safety systems, Radiation hazards).

WCAP-2056 Field 18I
CFSTI Prices: HC$4.00 MF$1.00

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
HIGH TEMPERATURE SUPERCRITICAL PRESSURE WATER LOOP. PART IV. FORCED CONVECTION HEAT TRANSFER TO WATER AT NEAR-CRITICAL TEMPERATURES AND SUPER-CRITICAL PRESSURES,
by A. A. Bishop, R. O. Sandberg, and L. S. Tong.
Nov 64, 146p Unclassified report
Contract AT(30-1)-2948
See also WCAP-2056 (Pt. 3).

Descriptors: (*Heat transfer, Pipes), (*Light water reactors, Heat transfer).

WCAP-2644 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
MINIATURE NEUTRON DETECTOR DEVELOPMENT.
Quarterly progress rept. for 1 Apr-30 Jun 64,
by J. Weisman. 15 Jul 64, 17p EURAEC-1150
Contract AT(30-1)2827
Unclassified report

Descriptors: (*Neutron detectors, Miniature electronic equipment).

WCAP-2666 Field 18D
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
MINIATURE NEUTRON DETECTOR DEVELOPMENT.
Final rept.,
ed by J. Weisman. Oct 64, 85p EURAEC-1278
Contract AT(30-1)-2827
Unclassified report

Descriptors: (*Neutron detectors, Miniature electronic equipment).

WCAP-3269-3 Field 18I, 18L, 18J
CFSTI Prices: HC$6.00 MF$1.50

Westinghouse Electric Co., Pittsburgh, Pa. Atomic Power Div.
LARGE CLOSED-CYCLE WATER REACTOR RESEARCH AND DEVELOPMENT PROGRAM.
Progress rept. for 1 Apr-30 Jun 64,
30 Jun 64, 230p
Contract AT(30-1)-3269
Unclassified report

Descriptors: (*Light water reactors, Design), (*Power reactors, Light water reactors).

XDC-59-10-69 Field 18F, 20H, 21F
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Cincinnati, Ohio. Aircraft Nuclear Propulsion Dept.
DATA REPORT AND ANALYSIS OF MEASUREMENTS MADE IN WATER BEHIND ARRAYS OF LIH AND LI6H,
by A. W. Casper. 9 Oct 59, 34p
Contract AT(11-1)-171
Unclassified report

Descriptors: (*Shielding, Lithium compounds), (*Neutrons, Dose rate), (*Gamma rays, Dose rate).

Y-KB-53 Field 18F, 6R, 18J
CFSTI Prices: HC$1.00 MF$0.50

Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
HEALTH PHYSICS CONSIDERATIONS ASSOCIATED WITH THORIUM PROCESSING,
by C. N. West. 19 Jan 65, 25p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Thorium, Reactor fuel processing), (*Health physics, Thorium).

19. Ordnance

N65-22658 Field 19D
CFSTI Prices: HC$2.00 MF$0.50

Gruman Aircraft Engineering Corp., Bethpage, N. Y. Research Dept.
ROCKET TRAJECTORY OPTIMIZATION.
Final technical summary rept. for Mar 61-Dec 64,
by H. Hinz. Apr 65, 26p Rept. no. RE-208
Contract NAS8 1549
NASA CR-62442

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Rocket trajectories, Optimization), (*Optimization, Rocket trajectories).

Patent 3,208,345 Field 19F, 19A

ANTI-SPIN DEVICE.
Patent assigned to Army,
by Emil W. Thompson. 28 Sep 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Spin-stabilized ammunition, Gun components), Projectiles, Rifling, Obturation-(Ballistics), Rotating bands, Patents.

The anti-spin device obtains a reduction in the spin rate of a projectile which is fired from a rifle tube. An expander disc, upon firing of the projectile, moves forward to expand the obturator to engage the rifling of the weapon tube.

Patent 3,208,384 Field 19G, 1B, 16D

ROCKET THRUST NEUTRALIZER.
Patent assigned to Navy,
by Gilbert Fountain. 28 Sep 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Aircraft ammunitions, Rockets), (*Rockets, Thrust), Rocket motor nozzles, Guided missile components, Aircraft equipment, Blast, Patents.

The removable attachment for a rocket not only renders the rocket nonpropulsive but also has structure for protecting the carrying aircraft against the blast of the hot rocket gases. A cup-shaped element on the rocket diverts laterally the hot thrust gases, and a blast shield circumferentially of the cup-shaped element deflects the gases in fore and aft directions so that the thrust vectors of the gases balance and cancel out.

Patent 3,208,386 Field 19A

STRIP BULLET.
Patent assigned to Navy,
by Ottow W. Schneider and Hubert M. Ross, Jr.
28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fragmentation ammunition, Small arms), Lead, Wire, Patents, Degradation.

The bullet is for use in small arms. When fired at close range the bullet disperses into lethal fragments. The whining projectile is useful for psychological effect in law enforcement work. The bullet consists of a bundle of seven compacted lead wire segments and a metal base cup firmly fitted around one end of the bundle. The bundle and cup are swaged into the shape of a bullet. The bullet separates into segments by centrifugal force due to the rifling twist of the firearm.

Patent 3,209,349 Field 19E

TARGET-CARRIER AIRCRAFT PROTECTIVE SYSTEM.
Patent assigned to Air Force,
by Franklin H. Prestwood. 28 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Aircraft fire control systems, Safety), (*Safety, Aircraft fire control systems), Patents, Military training, Radar equipment, Safety devices.

The safety system prevents the target-carrier aircraft from being fired upon by the attacking aircraft during aerial target practice. The attacking aircraft receives an arming signal from the target-carrier aircraft and this signal is interrupted whenever the target-carrier aircraft receives a radar signal, such as would occur should the attacking aircraft fire control system lock onto the target-carrier aircraft. This system inherently fails safe since component failure in the transmitter of the target-carrier aircraft or the receiver of the attack aircraft sufficient to destroy the receiver output disarms the fire control system and since component failure in the radar receiver of the target-carrier aircraft blocks the locally generated test signal and thus deenergize the keying relay of the transmitter.

Patent 3,211,058 Field 19F

ROUND RAMMER.
Patent assigned to Army,
by Paul H. Dixon and Maynard B. Wallin. 12 Oct 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Loaders, Automatic weapons), Patents, Breech mechanisms, Guns, Aircraft guns.

The rammer is for ramming a round of ammunition into the breach of a cannon. It has a cyclic rate of 500 rounds per minute. The rammer utilizes the counter-recoil motion of the gun barrel and shuttle type bolt. The structure permits a short barrel travel which makes the cannon adaptable to aircraft installation.

Patent 3,211,099 Field 19A

TIME DELAY MECHANISM.
Patent assigned to Army,
by Dragolycub Popovitch. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Time-delay fuzes, Timing devices), (*Timing devices, Time-delay fuzes), Fuzes(Ordnance), Patents.

The time fuse is for small-diameter artillery and other ammunition. A hollow ball rotor in a fuze is subjected to a predetermined braking torque by a helical-type spring element adjustably tightened into frictional engagement as a wrapping about the diameter. This reduces the angular velocity of the ball rotor in aligning its axis of symmetry in flight with the spin axis of the round or projectile in which it is mounted. The time required for the rotor to do this is the time delay.

Patent 3,212,054 Field 19H, 17G, 9A

TRANSMITTER KEYING AND RECEIVER BLANKING CIRCUIT.
Patent assigned to Navy,
by Robert S. Gardner. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Acoustic torpedoes, Circuits), (*Circuits, Homing devices), Patents.

The automatic steering system is for directing a torpedo equipped with steering gear toward a target. An echo signaling system is provided with an improved circuit which is adapted to blank the echo signal receiver during keying of the transmitter. The voltage supplied to the transmitter power amplifier is utilized for blanking the receiver during transmission intervals.

20. Physics

AD-460 659 Field 20M
CFSTI Price: HC$1.00

Watervliet Arsenal, N. Y. Benet Labs.
TEMPERATURE FIELD IN A SLAB CONTAINING AN INSULATING FILAMENT.
Technical rept.,
by Michael J. Pascual, Stephen D. Beck, and John E. Zweig. Mar 65, 18p Rept. no. WVT-6511
Proj. DA 1A 0 13001A039
Unclassified report

Descriptors: (*Thermal conductivity, Thermal insulation), (*Thermal insulation, Thermal conductivity), Thermal diffusion, Filaments, Two-dimensional flow, Temperature, Partial differential equations, Transport properties, Conformal mapping.

An infinite slab of heat conducting material has plane parallel boundaries which are kept at constant but different temperatures. Imbedded halfway between and parallel to these faces is a plane insulating filament infinite in length but of finite width. The steady state temperature filed induced by this filament is determined by solving the equivalent two-dimensional problem. The method of conformal mappings is used since Laplace's equation in two dimensions must be satisfied by the required temperature function. The solution is obtained for a filament of arbitrary width k. Allowing k to approach infinity in such a way that one end remains fixed results in the solution for the case of a semi-infinite filament. An evaluation is made for various filament widths from which graphs of several flow curves and isotherms are constructed. (Author)

ANL-6819 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
PHYSICS DIVISION SUMMARY REPORT, SEPTEMBER-DECEMBER 1963,
by Lowell M. Bollinger. Dec 63, 61p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Elementary particles, Physics).

BNL-8245 Field 20H, 12A
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A NOTE ON THE COMPOSITENESS CONDITION IN POTENTIAL THEORY,
by R. Rockmore. Jul 64, 7p
Contract AT(30-2)-GEN-16
Unclassified report

Prepared in cooperation with Rutgers-The State Univ., New Brunswick, N. J. Dept. of Physics.

Descriptors: (*Potential scattering, S-matrix), (*Potential theory, Potential scattering).

BNL-8971 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
VARIABLE MODE SOLID STATE MAGNET CYCLE TIMER,
by R. Frankel. 10 Mar 65, 5p, CONF-650306-13
Contract AT30 2GEN16
Unclassified report

Prepared for presentation at Particle accelerator Conference, Washington, D. C.

Descriptors: (*Synchrotrons, Timing devices), (*Timing devices, Synchrotrons).

BNL-9062 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
MAGNETIC FINGERS,
by R. B. Palmer. Mar 65, 18p CONF-650111-2
Contract AT-30-2-GEN-16
Unclassified report

Presented at Cern Informal Neutrino Conference, Geneva, 20-22 Jan 65.

Descriptors: (*Particle accelerator techniques, Focusing), (*Neutron beams, Particle accelerators).

BNL-9195 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE INTERACTION OF POLARIZED NEUTRONS WITH POLARIZED HE3 NUCLEI ADSORBED IN ZEOLITE,

by R. I. Schermer and L. Passell. 1965, 3p
CONF-650706-15
Contract AT-30-2-GEN-16
Unclassified report

Prepared from International Conference on the study of nuclear structure with neutrons, Antwerp.

Descriptors: (*Helium, Neutron reactions), (*Neutron reactions, Ion exchange resins).

CALT-68-2 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
OCTET ENHANCEMENT,
by Roger F. Dashen, Steven C. Frautschi, and Murray Gell-Mann. 1964, 22p CONF-550-92
Contract AT(04-3)-41
Unclassified report

Prepared for presentation at the International Conference on High-energy Physics, Dubna, USSR, Aug 1964.

Descriptors: (*Nuclear reactions, Nuclear models), (*Elementary particles, Nuclear reactions).

CALT-68-6 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
POLARIZATION OF LAMBDA HYPERONS IN ASSOCIATED PHOTOPRODUCTION,
by D. E. Groom and J. H. Marshall. 1963, 6p
CONF-550-94
Contract AT(04-3)-41
Unclassified report

Descriptors: (*Photonuclear reactions, Hyperons), (*Hyperons, Polarization).

CALT-68-8 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
TRIPLETS AND TRIALITY,
by Murray Gell-Mann. 1964, 8p CONF-550-95
Contract AT(04-3)-41
Unclassified report

Presented at the International Conference on High-Energy Physics, Dubna, USSR, Aug. 1964.

Descriptors: (*Nuclear spins, Field theory), (*Field theory, Nuclei).

CALT-68-14 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
THE SYMMETRY BREAKING INTERACTION,
by Yuval Neeman. Oct 64, 10p CONF-641004-12
Contract AT(11-1)-68
Unclassified report

Prepared to be presented at American Physical Society, Chicago.

Descriptors: (*Nuclear reactions, Field theory), (*Elementary particles, Field theory).

CALT-68-31 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

California Inst. of Tech., Pasadena.
BEYOND SU(3),
by Yuval Neeman. 1965, 39p CONF-650106-6
Contract AT(11-1)-68
Unclassified report

Presented at Conference on Symmetry Principles at High Energy (2nd), Coral Gables, Fla.

Descriptors: (*Nuclear models, Field theory), (*Elementary particles, Field theory).

CEAL-1016 Field 20I, 20G
CFSTI Prices: HC$1.00 MF$0.50

Cambridge Electron Accelerator, Mass.
MAGNETIC BOTTLE FOR PRODUCING POSITRONS AND POLARIZED ELECTRONS,
by Kenneth W. Robinson. 19 Feb 65, 16p
Contract AT(30-1)-2076
Unclassified report

Descriptors: (*Positrons, Production), (*Electrons, Production), (*Plasma medium, Particle accelerators).

CONF-550-93 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
PHOTOPRODUCTION OF NEUTRAL PIONS IN HYDROGEN AND DEUTERIUM,
by C. R. Clinesmith, G. L. Hatch and A. V. Tollestrup. 1963, 12p Unclassified report
Contract AT(04-3)-41
Prepared for presentation at the International Conference on High-Energy Physics, Dubna, USSR, Aug. 1964.

Descriptors: (*Photonuclear reactions, Pions), (*Pions, Photonuclear reactions).

CONF-550-97 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
PERIPHERAL MODEL FOR RHO AND RHO PI PRODUCTION,
by Marc Ross. 1964, 6p Unclassified report
Contract AT(11-1)-1112
Prepared for presentation to International Conference on High-Energy Physics, Dubna, USSR, Aug. 1964.

Descriptors: (*Meson cross sections, Nuclear models), (*Pions, Neutron reactions).

CONF-640606-18 Field 20H, 18B
CFSTI Prices: HC$1.00 MF$0.50

Western Reserve Univ., Cleveland, Ohio. Dept. of Physics.
MOSSBAUER-EFFECT IN Yb 171,
by G. Michael Kalvius. 1964, 17p CONF-64-113-32
Contract AT(11-1)-1297
Unclassified report

Descriptors: (*Ytterbium, Mossbauer effect), (*Cryogenics, Ytterbium), Hyperfine structure.

CONF-641210-17 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

California Inst. of Tech., Pasadena.
EVIDENCE FOR PARITY ADMIXTURE IN NUCLEAR STATES

by F. Boehm. 1964, 10p
Contract AT(04-3)-41
Unclassified report

Presented at American Physical Society Meeting, Berkeley., Calif., 23 Dec 1964.

Descriptors: (*Parity, Nuclear energy levels), (*Nuclear energy levels, Parity).

CONF-650501-3 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
SOME NEW NONLINEAR ITERATION TECHNIQUES FOR SOLVING NEUTRON DIFFUSION PROBLEMS,
by Eugene L. Wachspress. Feb 65, 9p
Contract W-31-109-eng-52
Unclassified report

Prepared from the application of computing methods to reactor problems, Argonne, Ill.

Descriptors: (*Neutron transport theory, Iterative methods), (*Iterative methods, Neutron transport theory).

CONF-650505-2 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
RECENT ADI THEORY AND RESULTS FOR ELLIPTIC EQUATIONS,
by E. L. Wachspress. Feb 65, 9p
Contract W-31-109-eng-52
Unclassified report

Prepared for presentation at IFIP Congress, New York, 24-29 May 1965.

Descriptors: (*Neutron transport theory, Numerical analysis).

COO-1195-8 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Illinois Univ., Urbana.
SEARCH FOR ANOMALOUS PHOTOPION PRODUCTION FROM HELIUM,
by L. Crieges, G. Moscati and B. M. K. Nefkens.
1964, 11p Unclassified report
Contract AT(11-1)-1195
Descriptors: (*Helium, Photonuclear reactions), (*Pions, Photonuclear reactions).

GA-6026 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
HEXSCAT -- COHERENT ELASTIC SCATTERING OF NEUTRONS BY HEXAGONAL LATTICES,
by Y. D. Naliboff and J. U. Koppel. 15 Dec 64, 20p Unclassified report
Contract AT(04-3)-167
Descriptors: (*Neutrons scattering, Programming-(Computers)), (*Programming(Computers), Neutron scattering).

GA-6281 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
CALCULATION OF THERMAL SCATTERING KERNELS,
by James A. Young and J. U. Koppel. 5 Apr 65, 27p
CONF-650504-7
Contract AT(04-3)-167
Unclassified report

Prepared for presentation at the IAEA Symposium on Pulsed Neutron Methods, Karlsruhe, Ger.

Descriptors: (*Neutron cross sections, Thermal neutrons).

IITRI-1184-16 Field 20C
CFSTI Prices: HC$1.00 MF$0.50

IIT Research Inst., Chicago, Ill.
MAGNETIC PROPERTIES OF INSULATORS.
Quarterly rept no. 16, 16 Nov 64-15 Feb 65,
by J. J. Markham. 23 Mar 65, 20p
Contract AT(11-1)-587
Unclassified report

Descriptors: (*Electric insulation, Magnetic properties), Paramagnetic resonance, Color centers, Atomic energy levels, Electron transitions.

N65-15368 Field 20F, 6P
CFSTI Prices: HC$1.00 MF$0.50

Texas Univ. Dallas. Southwestern Medical School.
INFLUENCE OF GRAVITY ON UNICELLULAR ORGANISMS AND OPTIMIZATION OF THE ULTRAVIOLET FLYING SPOT MICROSCOPE FOR LIVING CELL OBSERVATIONS.
Semiannual status rept., 1 Apr-30 Sep 63,
by D. Jenkins. 1963, 5p
NSG-210-63
NASA CR-51799
Unclassified report

Descriptors: (*Microscopes, Cells(Biology)), (*Cells(Biology), Microscopes).

N65-16993 Field 20H
CFSTI Prices: HC$5.00 MF$1.25

Texas A and M Univ., College Station. Dept. of Mathematics.
HARTREE-FOCK SOLUTIONS WITHOUT EXCHANGE FOR NORMAL BERYLLIUM DETAILED TECHNICAL SUPPLEMENT ON SPACE TECHNOLOGY PROJECT NO. 5,
Progress rept.,
by G. E. Abdo, C. W. Conatser and E. R. Keown.
Aug 63, 183p
NSG239 62
NASA CR-51667
Unclassified report

Descriptors: (*Atomic energy levels, Beryllium), (*Beryllium, Atomic energy levels).

N65-17060 Field 20K
CFSTI Prices: HC$2.00 MF$0.50

California Univ., Berkeley.
FINITE ELEMENT SOLUTION FOR AXISYMMETRICAL SHELLS,
by Z. A. Lu, J. Penzien and E. P. Popov. 1963, 35p
NSG 274-63
NASA CR-53093
Unclassified report

Descriptors: (*Structural shells, Structural properties).

N65-17515 Field 20N
CFSTI Prices: HC$2.00 MF$0.50

Republic Aviation Corp., Farmingdale, N. Y. Mfg. Research Dept.
DESIGN, DEVELOPMENT, MANUFACTURE, AND DELIVER NEW CONCEPTS FOR HIGH ENERGY RATE FORMING SYSTEM.
Quarterly rept. no. 2 for Jan 65,
by B. Leftheris. Jan 65, 30p
Rept. no. RAC-2788
Contract NAS8 11811
NASA CR-60848

Unclassified report

Descriptors: (*Electromagnetic waves, Generators).

N65-23062 Field 20D, 12B
CFSTI Prices: HC$2.00 MF$0.50

Honeywell, Inc., St. Paul, Minn. Military Products Group Research Lab.
RESEARCH AND STUDY IN SYSTEM OPTIMIZATION TECHNIQUES.
Progress rept., 14 Nov 64-14 Feb 65,
by D. L. Lukes. 22 Feb 65, 35p MPG-1546-QR-1
Contract NAS8 5222
NASA CR-62475

Unclassified report

Descriptors: (*Motion, Stability), (*Guidance, Optimization), Differential equations, Functional analysis.

N65-24923 Field 20L
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE ROTATING SUPERCONDUCTOR. PART III: THE SUPERELECTRONS AS AN INCOMPRESSIBLE CHARGED FLUID,
by M. M. Saffren. 31 May 65, 9p
JPL-TR-32-650, Pt. III
Contract NAS7 100
NASA CR-63062

Unclassified report

Descriptors: (*Superconductors, Rotation), (*Electrons, Superconductors).

N65-25407 Field 20C
CFSTI Prices: HC$1.00 MF$0.50

TRW Space Technology Labs., Redondo Beach, Calif. Physical Electronics Lab.
HIGH VOLTAGE BREAKDOWN INITIATED BY PARTICLE IMPACT.
Technical rept.,
by J. C. Slattery, J. F. Friichtenicht, and D. O. Hansen. Apr 65, 9p
Contract NASw936
NASA CR-63185

Unclassified report

Descriptors: (*Electric discharges, Electrodes), (*Particle beams, Electric discharges).

N65-26855--N65-26911 Field 20M
CFSTI Prices: HC$3.75 MF$2.75

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
SYMPOSIUM ON THERMAL RADIATION OF SOLIDS,
ed. by S. Katzoff. 1965, 620p
NASA SP-55, ML TDR-64-159

Unclassified report

A symposium held at San Francisco, Calif., 4-6 Mar 64, sponsored by Research and Technology Div., USAF, and National Bureau of Standards.

Descriptors: (*Symposia, Thermal radiation), (*Thermal radiation, Solids), Report.

N65-27395 Field 20M, 21I
CFSTI Prices: HC$5.00 MF$1.00

Rocketdyne, Canoga Park, Calif.
BOILING HEAT TRANSFER FOR CRYOGENICS.
Final rept. for 16 May 63-15 Feb 64,
by J. D. Seader, W. S. Miller, and L. A. Kalvinskas.
Jun 65, 171p
Contract NAS8 5337 Unclassified report
NASA CR-243
Descriptors: (*Cryogenics, Heat transfer), (*Heat transfer, Boiling).

N65-28632 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

TRW Space Technology Labs., Redondo Beach, Calif.
PARTICLE PARAMETER SELECTION SYSTEM FOR AN ELECTROSTATIC PARTICLE ACCELERATOR.
Rept. on Investigation of Hypervelocity Impact Phenomena,
by J. F. Friichtenicht. Jul 65, 9p
Contract NASw936 Unclassified report
NASA CR-263
Descriptors: (*Electrostatic accelerators, Hypervelocity projectiles), (*Impact shock, Simulation).

N65-28806 Field 20E, 22B
CFSTI Prices: HC$7.00 MF$1.75

Perkin-Elmer Corp., Norwalk, Conn.
DETERMINATION OF OPTICAL TECHNOLOGY EXPERIMENTS FOR A SATELLITE,
by Herbert F. Wischnia, Harold S. Hemstreet, and John G. Atwood. Jul 65, 462p
Contract NAS8 11408
NASA CR-252

Unclassified report

Descriptors: (*Lasers, Communication Systems), (*Spacecraft, Communication systems).

NAA-SR-MEMO-10853 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
ANALYSIS OF NEUTRON TRANSMISSION THROUGH SLABS OF LITHIUM HYDRIDE,
by R. S. Rubner. 4 Jan 65, 21p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Neutron transport theory, Lithium compounds), (*Lithium compounds, Hydrides).

NYO-2722-1 Field 20M, 11F, 7D
CFSTI Prices: HC$4.00 MF$1.00

Delaware Univ., Newark. Dept. of Chemical Engineering.

STATISTICAL THERMODYNAMICS OF METALLIC SOLUTIONS.
Final rept. for 1 Feb 61-30 Jun 64,
by L. P. Skolnick and C. E. Birchenall.
1964, 130p
Contract AT(30-1)-2722
Unclassified report

Descriptors: (*Metals, Solutions), (*Solutions, Thermodynamics).

ORNL-P-153 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SIMPLE MOMENTUM PROBE FOR PLASMA STUDIES,
by I. Alexeff and W. D. Jones. 1961, 7p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Plasma medium, Probes-(Electromagnetic)), (*Probes(Electromagnetic, Plasma medium).

ORNL-P-1067 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SADDLE POINT ROTATIONAL STATES FROM RESONANCE FISSION OF ORIENTED NUCLEI,
by J. W. T. Dabbs, F. J. Walter, and G. W. Parker.
1964, 13p CONF-650301-8; SM-60/5
Contract W-7405-eng-26
Unclassified report

Presented at Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission, Nuclear resonance), (*Nuclear energy levels, Fission).

ORNL-P-1082 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
CHANNEL ANALYSIS OF NEUTRON INDUCED FISSION OF EVEN-EVEN ISOTOPES NEAR THRESHOLD,
by R. W. Lemphere. 1964, 21p CONF-650301-9
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission, Even-even nuclei), (*Even-even nuclei, Neutron reactions).

ORNL-P-1088 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
CORRELATED FRAGMENT ENERGY MEASUREMENTS AND MASS-VS.-ANGLE CORRELATIONS IN 226 RA PLUS P FISSION,
by H. W. Schmitt, J. W. T. Dabbs, and P. D. Miller.
1965, 15p CONF-650301-10
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Radium, Fission).

ORNL-P-1116 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
NEUTRON CROSS SECTION MEASUREMENTS USING PULSED SOURCES,
by J. A. Harvey. 1965, 21p CONF-650217-1
Contract W-7405-eng-26
Unclassified report

Presented at Symposium on Pulsed High Intensity Fission Neutron Sources, Washington, D. C., 18 Feb 1965.

Descriptors: (*Neutron cross sections, Measurement).

ORNL-P-1131 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
RESIDUAL RADIATION STUDIES,
by C. B. Fulmer, K. S. Toth, and M. Barbier. 1964,
8p CONF-650306-54
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Nuclear particles).

ORNL-P-1133 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
A LOW-ENERGY SEPARATED-ORBIT CYCLOTRON,
by E. D. Hudson, R. S. Lord, and R. E. Worsham.
1963, 7p CONF-650306-51
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Cyclotron, Particle accelerator techniques).

ORNL-P-1134 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DEVELOPMENTS IN GRIDDED ION LENSES,
by J. W. Johnson. 1964, 9p CONF-650306-52
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Van de Graaff generators, Lenses), (*Lenses, Ions).

ORNL-P-1135 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
MAGNET FOR AN 800-MEV SEPARATED-ORBIT CYCLOTRON,
by R. S. Lord and E. D. Hudson. 1963, 6p
CONF-650306-53
Contract W-7405-eng-26 Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Cyclotron magnets, Particle accelerator components).

ORNL-P-1137 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
IMPROVEMENTS IN THE ORIC RF SYSTEM,
by S. W. Mosko and N. F. Ziegler. 1963, 5p
CONF-650306-55
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Cyclotrons, Radio frequency).

ORNL-P-1148 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
STABILITY AND TOLERANCES OF THE SEPARATED-ORBIT CYCLOTRON,
by R. E. Worsham. 1964, 6p CONF-650306-57
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Cyclotrons, Stability).

ORNL-P-1150 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
ACCELERATING CAVITIES FOR AN 800-MEV SOC,
by N. F. Ziegler. 1963, 8p CONF-650306-59
Contract W-7405-eng-26
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Cyclotrons, Particle accelerator techniques).

ORNL-P-1240 Field 20B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
METHODS OF ANALYSIS FOR LOCALLY-ORDERED ARRANGEMENTS AND ATOMIC DISPLACEMENTS BY X-RAY DIFFRACTION,
by C. J. Sparks and B. Borie. 22 Apr 65, 86p
CONF-650203-8
Contract W-7405-eng-26
Unclassified report

Presented at the National American Institute of Mechanical Engineers Meeting, Chicago, 15 Feb 65.

Descriptors: (*X-ray diffraction analysis, Atomic structure), (*Solid solutions, X-ray diffraction analysis).

ORNL-TM-1044 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SOME RECENT NUCLEAR CROSS SECTION MEASUREMENTS AT ORNL,
Memo. for 1 Oct 64-31 Jan 65,
by P. H. Stelson. 17 Feb 65, 30p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear cross sections, Measurement).

ORNL-TM-1117 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
A GENERAL HAUSER-FESHBACH NUCLEAR-SCATTERING COMPUTER PROGRAM,
by William R. Smith. May 65, 16p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear scattering, Programming-(Computers)), (*Programming(Computers), Nuclear scattering).

Patent 3,209,246 Field 20C, 9C, 14B

MAGNETIC FIELD DETECTOR WITH A TWO-CORE FLUX GATE MAGNETOMETER FOR A D.C. PERMEAMETER.
Patent assigned to Navy,
by Charles Q. Adams. 28 Sep 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Permeameter, Magnetometers), (*Magnetometers, Permeameters), Permeability-(Magnetic), Measuring devices(Electrical + Electronic), Circuits, Patents.

The permeameter is for measuring the magnetic properties of high permeability strip materials. A self-balancing magnetometer circuit is provided for a permeameter. Two closed magnetic core circuits are employed.

Patent 3,209,281 Field 20E, 20I, 9C

METHOD AND APPARATUS FOR DYNAMIC PINCH PULSE MASER PUMPING.
Patent assigned to AEC,
by Stirling A. Colgate and Alvin W. Trivelpiece.
28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Masers, Pumping(Electronics)), (*Pumping(Electronics), Masers), Gas ionization, Light, Ultraviolet radiation, Electromagnetic pulses, Magnetic pinch, Pulse generators, Patents.

A method and apparatus is provided for pumping masers utilizing pulse radiation fields in the optical and ultraviolet frequency range produced from a high temperature plasma. A method is provided in which the maser is pumped with fields produced at select frequencies and at intensity levels heretofore unattainable.

Patent 3,210,841 Field 20F, 11A

METHOD AND APPARATUS FOR LENS MOUNTING.
Patent assigned to Army,
by Owen T. Costello. 12 Oct 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lenses, Mounting brackets), (*Mounting brackets, Lenses), (*Moistureproofing, Optical equipment components), Sealing compounds, Optical equipment, Patents.

A lens is mounted in a cylindrical holder to produce a moistureproof mounting without the danger of fracture or clouding of the lens. This is accomplished by pressing the lens element against a yieldable moistureproof material and maintaining the material always under pressure.

Patent 3,211,910 Field 20F, 20M

CALIBRATED INFRARED SOURCE, ADJUSTABLE FOR SPECTRUM, FREQUENCY, AND INTENSITY.
Patent assigned to Navy,
by Richard D. Anderson. 12 Oct 65 Unclassified patent
Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Infrared radiation, Sources), Calibration, Blackbody radiation, Infrared spectroscopy, Frequency, Intensity, Patents.

The infrared radiation source has rapidly adjustable chopping frequencies, apertures and wavelengths without requiring modification of the basic elements. Raw infrared energy is obtained from a standard black body. A structural assembly with a series of apertures and filters permit any desired aperture size and filter to be placed before the black body cavity.

PB-168 558 Field 20F, 17H
CFSTI Prices: HC$1.00 MF$0.50

Smithsonian Institution, Cambridge, Mass.
Astrophysical Observatory.
TRANSMISSION COEFFICIENT OF THE BAKER-NUNN OPTICAL SYSTEM.
Special rept. on Research in Space Science,
by Fred D. Young and Karen Hebb. 11 Oct 65, 18p
Rept. no. SAO-SR-187
Grant NSF GP2999
Unclassified report

Descriptors: (*Tracking cameras, Optics), (*Optics, Tracking cameras), Light transmission, Lenses, Optical equipment, Satellites(Artificial), Tracking.

In general, it is difficult to determine analytically the transmission coefficient as a function of wavelength for a given lens system. But by taking advantage of the symmetry of the three-element corrector cell system of the Baker-Nunn satellite tracking camera, an expression for the transmission coefficient is derived for optimum conditions of the glass. This is done by determining the fractional absorption loss, as a function of wavelength, due to each glass element, and then assuming the transmission coefficient at any given wavelength to be that fractional part of the light which is transmitted by the three elements as a system at that wavelength. Schott KZFS-2 flass is used for the two outer elements; Schott SK-14 for the central element. This combination reduces the chromatic aberration to zero at three distinct wavelengths. The subsequent path of the radiation, which includes reflection from a 31-inch spherical mirror before it reaches the Kodak Royal-X Pan Recording emulsion, is not considered. Results show the transmission curve to be essentially flat at approximately 97% transmission from 5000A to 7000A. The absence of response short of 3000A is of no consequence due to the onset of the atmospheric ozone absorption. (Author)

RPI-328-32 Field 20G
CFSTI Prices: HC$4.00 MF$0.75

Rensselaer Polytechnic Inst., Troy, N. Y.
LECTURE NOTES ON THE OPERATION OF THE R.P.I. LINAC,
by R. Fullwood. 30 Aug 64, 109p
Contract AT(30-3)-328
Unclassified report

Descriptors: (*Linear accelerators, Operation).

RPI-328-35 Field 20G
CFSTI Prices: HC$4.00 MF$1.00

Rensselaer Polytechnic Inst., Troy, N. Y.
LINEAR ACCELERATOR PROJECT.
Progress rept. for Jan-Mar 65.
Mar 65, 149p
Contract AT(30-3)-328
Unclassified report

Descriptors: (*Linear accelerators, Design).

RPI-3030-3 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y.
NUCLEAR QUADRUPOLE COUPLING STUDIES IN SOLIDS.
Annual rept.,
by Philip A. Casabella. May 65, 5p
Contract AT(30-1)-3030
Unclassified report

Descriptors: (*Nuclear magnetic moments, Quadrupole moments), (*Quadrupole moments, Solids).

SB-537 Field 20B

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
CRYSTALS, PART I: METALLIC AND SINGLE.
Price list, selective bibliography of Government research repts. and translations for Jan 59-Apr 65.
Apr 65, 44p Unclassified report

Available free from the Clearinghouse. Suppl. to CTR-367.

Descriptors: (*Crystals, Bibliographies), (*Bibliographies, Crystals), Single crystals, Metallic crystals, Patents, Crystal growth, Physical properties, Crystal structure.

Lists 728 domestic and foreign references added to the CFSTI collection during the period January 1959 through April 1965. Covers research on whiskers; single crystals; metallic crystals.

SB-538 Field 20B

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
CRYSTALS, PART II: LATTICES AND STRUCTURE.
Price list, selective bibliography of Government research repts. and translations for Jan 59-Apr 65.
Apr 65, 40p Unclassified report

Available free from the Clearinghouse. Suppl. to CTR-368.

Descriptors: (*Crystals, Bibliographies), (*Bibliographies, Crystals), Crystal lattices, Crystal structure, Crystal lattice defects, Optical properties, Physical properties, Processing.

Lists 715 domestic and foreign references added to the CFSTI collection during the period January 1959 through April 1965. Covers research on crystal lattices and lattice defects, crystal structure, crystal properties, optical properties, crystal processing and crystals (theory and miscellaneous).

SB-539 Field 20B, 9A

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
CRYSTALS, PART III: CERAMIC AND OTHER PIEZOELECTRIC MATERIALS; QUARTZ; GROWTH AND SYNTHETIC.
Price list, selective bibliography of Government research repts. and translations for Jan 59-Apr 65.
Apr 65, 28p Unclassified report

Available free from the Clearinghouse. Suppl. to CTR-369.

Descriptors: (*Crystals, Bibliographies), (*Bibliographies, Crystals), Ceramic materials, Piezoelectric crystals, Quartz, Crystal growth, Crystallization, Recrystallization, Epitaxial growth, Crystal filters, Crystal oscillators, Crystal ovens, Crystal rectifiers, Crystallography.

Lists 386 domestic and foreign references added to the CFSTI collection during the period January 1959 through April 1965. Covers research on ceramic and other piezoelectric materials, quartz crystals, crystallization, recrystallization, crystal growth and epitaxial growth, and oscillators, rectifiers, filters, ovens and crystallography.

SU-IPR-7 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Stanford Univ., Calif. Inst. for Plasma Research.
STUDIES OF PLASMA OSCILLATIONS.
Quarterly status rept. no. 21, 1 Dec 64-28 Feb 65,
Mar 65, 27p
Contract AT(04-3)-326
Unclassified report

Descriptors: (*Plasma oscillations, Electric discharges), (*Particle beams, Plasma oscillations).

SU-ML-1291 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Microwave Lab., Stanford Univ., Calif.
STUDIES OF PLASMA OSCILLATIONS.
Quarterly status rept. no. 20, 1 Sep-30 Nov 64,
by G. S. Kino. Jan 65, 31p
Contract AT(04-3)-326
Unclassified report

Descriptors: (*Plasma oscillations, Electric discharges), (*Electric discharges, Plasma oscillations).

TID-21387 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Vanderbilt Univ., Nashville. Graduate School.
THE SHAPE OF THE INTENSE POSITRON SPECTRUM OF SODIUM-22.
Master's thesis,
by William Henry Brantley. Aug 63, 33p
Unclassified report

Submitted to Vanderbilt Univ., Nashville. Graduate School.

Descriptors: (*Positrons, Particle spectra), (*Particle spectra, Sodium).

TID-21414 Field 20A
CFSTI Prices: HC$2.00 MF$0.50

Vanderbilt Univ., Nashville. Graduate School.
THE ABSORPTION OF SOUND IN METHANE-D 3.
Master's thesis,
by Thomas Riddall Mullins. Aug 64, 55p
Unclassified report

Submitted to Vanderbilt Univ., Nashville. Graduate School.

Descriptors: (*Methane, Absorption), (*Ultrasonics, Methane), Attenuation.

TID-21542 Field 20N
CFSTI Prices: HC$2.00 MF$0.75

Emory Univ., Atlanta, Ga.
THE DETERMINATION OF LOW ENERGY X-RAY MASS ABSORPTION COEFFICIENTS.
Final rept. 1 Jan 62 - 31 Oct 64,
by Randall W. Carter and Robert H. Rohrer. 1964, 48p
Contract AT(40-1)-2953
Unclassified report

Descriptors: (*X rays, Absorption).

TID-21715 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Washington Univ., St. Louis Mo. Dept. of Chemistry.
'STUDIES OF LOW-ENERGY NUCLEAR REACTIONS--DECAY SCHEMES STUDIES'.
Final rept., 15 Feb 64 - 14 Feb 65,
by Brian D. Pate. 31 Jan 65, 9p
Contract AT(11-1)-870
Unclassified report

Descriptors: (*Decay schemes, Nuclear reactions), (*Nuclear reactions, Decay schemes).

TID-21722 Field 20G, 9C
CFSTI Prices: HC$6.00 MF$1.25

Radio Corp. of America, Moorestown, N. J.
Missile and Surface Radar Div.
LOS ALAMOS MESON PHYSICS FACILITY (LAMPF).
RADIO FREQUENCY POWER EQUIPMENT.
Study rept.
31 Jul 64, 278p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Radio transmitters, Power supplies), (*Power supplies, Particle accelerators).

TID-21734 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Maryland Univ., College Park. Dept. of Physics and Astronomy.
CHARGE EXCHANGE SCATTERING OF LOW ENERGY K MINUS MESONS IN HYDROGEN.
by Gerald S. Abrams and Bice Sechi-Zorn.
Mar 65, 21p Technical rept. no. 441
Contract AT(40-1)-2904
Unclassified report

Descriptors: (*K mesons, Inelastic scattering), (*Inelastic scattering, Hydrogen).

TID-21737 Field 20M
CFSTI Prices: HC$3.00 MF$0.75

Temple Univ., Philadelphia, Pa. Research Inst.
THERMAL CONDUCTIVITY OF LIQUID METALS OVER THEIR ENTIRE LIQUID RANGE, I.E., FROM MELTING POINT TO CRITICAL POINT, IN RELATION TO THEIR ELECTRICAL CONDUCTIVITIES AND THE FALLACY OF DIVIDING METALS INTO 'NORMAL' AND 'ABNORMAL' THERMAL CONDUCTING ONES,
by Aristid V. Grosse. 7 Dec 64, 76p
Contract AT(30-1)-2082
Unclassified report

Descriptors: (*Liquid metals, Thermal conductivity), (*Thermal conductivity, Liquid metals).

TID-21744 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
NEUTRON RESONANCE INTEGRAL AND AGE DATA.
Reactor physics constants center newsletter no. 11,
by A. E. McArthy and P. J. Persiani. 29 Jan 65, 19p
Contract IAEA-W-31-109-eng-38
Unclassified report

Descriptors: (*Nuclear resonance, Integrals), (*Neutrons, Nuclear resonance).

TID-21783 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Texas Univ., Austin. Plasma Physics Lab.
RADIOFREQUENCY PLASMAS AT THE HYBRID ION-ELECTRON RESONANCE,
by H. Schlueter and C. J. Ransom. Jan 65, 46p
Contract AT(40-1)-3110
Unclassified report

Descriptors: (*Plasma medium, Radio frequency oscillators), (*Resonance, Plasma oscillations).

TID-21784 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Maryland Univ., College Park. Dept. of Physics and Astronomy.
A PROGRAM TO CALCULATE 3-BODY DISTRIBUTIONS FOR A GENERAL MATRIX ELEMENT,
by G. B. Yodh. Feb 65, 47p Technical rept. no. 442
Contract AT(30-1)-2464
Unclassified report

Descriptors: (*N-body problem, Elementary particles).

TID-21804 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Randall (Harrison M.) Lab. of Physics, Univ. of Michigan, Ann Arbor.
A SEARCH FOR A 1.65 MEV BETA-TRANSITION IN THE DECAY OF 25 MN 56,
by E. B. Arnold and H. J. Fischbeck. 1965, 10p
Contract AT(11-1)-1112
Unclassified report

Descriptors: (*Beta decay, Manganese), (*Nuclear energy levels, Beta decay), (*Manganese, Beta decay).

TID-21805 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor.
A MEASUREMENT OF THE BRANCHING RATIO FOR A PION-BETA DECAY EQUATION.
Doctoral thesis,
by William Keith Bertram. 1964, 57p
Contract AT(11-1)-1112
Unclassified report

Submitted to Michigan Univ. 1964.

Descriptors: (*Decay schemes, Beta decay).

TID-21807 Field 20F
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor.
OPTICAL RECTIFICATION.
Doctoral thesis,
by Michael Bass. 1964, 94p Unclassified report
Contract AT(11-1)-1112
Submitted to Univ. of Michigan.

Descriptors: (*Light transmission, Crystals), (*Crystals, Polarization).

TID-21823 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor. Dept. of Physics.
MEASUREMENT OF D, P GAMMA DIRECTIONAL CORRELATIONS IN 20 F,
by Ross W. Newsome, Jr. 1964, 60p
Contract AT(11-1)-1112
Unclassified report

Descriptors: (*Deuteron reactions, Proton scattering), (*Proton scattering, Gamma emission).

TID-21869 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science.
PARTICLE-HOLE SCATTERING SYSTEMS.
Technical rept. no. 78,
by C. A. Caine and R. H. Lemmer. Nov 64, 13p
Contract AT(30-1)-2098
Unclassified report

Descriptors: (*Nuclear scattering, Nuclear models), (*Nuclear models, Nuclear scattering).

TID-21872 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa.
RESEARCH ON INSTABILITIES IN HIGHLY IONIZED LOW-PRESSURE METAL-VAPOR PLASMAS.
Progress rept. for 1 Jan - 31 Mar 65,
by M. F. Hoyaux, G. W. Penney, F. J. Young, V. M. M. Claude, and A. Kettani. 31 Mar 65, 11p
EAC-5 Unclassified report
Contract AT(30-1)-3100

Descriptors: (*Plasma sheath, Stability), (*Metals, Vapors).

TID-28128 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
THE DECAY OF W 187,
by J. J. Reidy. 1965, 18p Unclassified report
Contract AT(11-1)-1112

Descriptors: (*Decay schemes, Tungsten), (*Tungsten, Decay schemes).

UCRL-2426 (Vol I) (1965 Rev) Field 20H
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
HIGH-ENERGY PARTICLE DATA. VOLUME I. KINEMATICS OF PARTICLES AS A FUNCTION OF KINETIC ENERGY,
by W. Peter Trower, Beverly Hill Willis, and Charles V. Stableford. Jan 65, 125p
Contract W-7405-eng-48
N65 15254

Unclassified report

Descriptors: (*Elementary particles, Dynamics), (*Energy, Elementary particles).

UCRL-7785-T Field 20N
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
FRESNEL ZONE PLATES FOR FOCUSING MICROWAVES,
by Ronald S. Hawke. 7 Jan 64, 24p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Microwaves, Focusing).

UCRL-7816 Field 20F, 7D
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE MEANING AND THE USE OF PHOTOMETRIC TERMS,
by George A. Condas. 20 May 64, 50p
Contract W7405ENG48

Unclassified report

Descriptors: (*Photometers, Theory).

UCRL-7942 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
DETERMINATION OF THE NUCLEON-NUCLEON ELASTIC SCATTERING MATRIX. II. PHASE SHIFT ANALYSES OF EXPERIMENTS NEAR 50, 95, 142, 210, AND 310 MEV,
by Malcolm H. MacGregor, Richard A. Arndt, and David S. Bailey. 29 Jun 64, 63p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Elastic scattering, Phase shift), (*Matrix algebra, Nuclear scattering).

UCRL-7943-T Field 20J
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Livermore.
N EQUAL 3 TRUNCATION WAVE FUNCTIONS AND ENERGIES FOR 18 MEMBERS OF THE HELIUM ISO-ELECTRONIC SEQUENCE,
by B. Curnutte, Jr. and J. E. Swain. Jan 65, 154p
Contract W-7405-ENG-48

Unclassified report

Prepared in cooperation with Kansas State University of Agriculture and Applied Science, Manhattan.

Descriptors: (*Helium, Perturbation theory), (*Perturbation theory, Helium).

UCRL-11151 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
A LIMITATION ON THE NUMBER OF PARTICLES GENERATED BY BOOTSTRAP DYNAMICS,
by Geoffrey F. Chew. 3 Dec 63, 10p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Baryons, Nuclear resonance), (*Particle trajectories, Resonance scattering).

UCRL-11781 Field 20H
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
ELASTIC SCATTERING OF STRONGLY ABSORBED IONS,
Doctoral thesis,
by Evangelos Hadjimichael. 8 Apr 65, 107p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Elastic scattering, Ions), (*Nuclear properties, Elastic scattering).

UCRL-11795 Field 20G, 18G
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
ELECTROSTATIC INDUCTION ELECTRODE SYSTEMS FOR BEAM-POSITION DETECTION,
by Allen J. Sherwood. 10 Feb 65, 11p
CONF-650306-27
Contract W-7405-eng-48

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Radiation measurement systems, Electrodes), (*Positrons, Radiation measurement systems).

UCRL-11798 Field 20G, 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
EXPERIENCE WITH COMPUTER MODELS OF TWO-DIMENSIONAL MAGNETS,
by Joseph H. Dorst. 5 Mar 65, 9p CONF-650306-24
Contract W-7405-eng-48

Unclassified report

Presented at the particle accelerator conference, Washington, D. C.

Descriptors: (*Synchrotrons, Programming(Computers)), (*Particle accelerator components, Programming-(Computers)).

UCRL-11808 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
DESIGN CONCEPTS OF MODERN ACCELERATOR VACUUM SYSTEMS -- PREDICTION VS. EXPERIMENTAL DATA,
by Finn S. Reinath and D. T. Scalise. 8 Mar 65; 14p CONF-650306-43
Contract W-7405-eng-48 Unclassified report

Presented at Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Vaccuum apparatus), (*Vacuum apparatus, Particle accelerators).

UCRL-11881 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
RECOIL-PROTON POLARIZATION IN NEGATIVE KAON-PROTON ELASTIC SCATTERING BETWEEN 700 AND 1400 MeV/c INCIDENT KAON MOMENTA.
Doctoral thesis,
by Ching Lin Wang. 19 Apr 65, 84p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Proton scattering, K mesons), (*K mesons, Elastic scattering).

UCRL-11886 Field 20I
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE EFFECT OF WAVE-PARTICLE INTERACTIONS ON THE STABILITY OF A CURRENT - CARRYING PLASMA.
Doctoral thesis,
by Gary Arthur Pearson. 4 Mar 65, 152p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Plasma medium, Stability).

UCRL-11971 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
EXPERIMENTAL STUDY OF MULTIPARTICLE RESONANCE DECAYS,
by Gerson Goldhaber. Jan 65, 99p CONF-650106-4
Contract W-7405-eng-48

Unclassified report

Presented at the Conference on Symmetry Principles at High Energy (2nd), Coral Gables, Fla, 20-22 Jan 1965.

Descriptors: (*Decay schemes, Nuclear resonance), (*Nuclear resonance, Decay schemes).

UCRL-12030-T Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
CUSPOLOGY AND THE FIVE BODY REACTION IN THE LOW 20 MEV ENERGY REGION,
by W. Brian Defacio. 18 Aug 64, 15p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Neutron scattering, Alpha cross sections), (*Elastic scattering, N-body problem).

UCRL-12461 Field 20C, 20I, 20J
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
DEPENDENCE OF THE SOLUTIONS OF THE SCHRODINGER EQUATION ON THE DIELECTRIC CONSTANT IN THE COMPLETE SCREENED COULOMB POTENTIAL,
by Carl A. Rouse. 15 Apr 65, 11p
CONF-650703-2
Contract W7405-eng-48

Unclassified report

Presented at the Iupac Conference on Properties and uses of Plasma, Moscow.

Descriptors: (*Field theory, Numerical analysis).

UCRL-13152 Field 20C
CFSTI Prices: HC$2.00 MF$0.50

California Univ., Davis.
ELECTRICAL AND EMISSIVE PROPERTIES OF EXPLODED CONFINED CONDUCTORS,
by Charles P. Nash, Robert P. Desiano, and Clifford W. Olsen. 1962, 26p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Exploding wires, Electrical properties), (*Emissivity, Exploding wires).

UCRL-14227-T Field 20M
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Berkeley.
CONTACT RESISTANCE BETWEEN METALS DURING TRANSIENT HEATING.
Doctoral thesis,
by Dale Albert Schauer. 1963, 59p
Contract W-7405-eng-48

Unclassified report

Submitted to California Univ., Berkeley.

Descriptors: (*Composite materials, Thermal conductivity), (*Thermal conductivity, Metals), (*Metals, Surface properties).

UCRL-16020 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
SUPER-ENERGY ACCELERATORS,
by Lloyd Smith. Mar 65, 4p CONF-650306-62
Contract W-7405-eng-48

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Synchrotrons, Strong focusing accelerators), (*Strong focusing accelerators, Synchrotrons).

UCRL-16034 Field 20H
CFSTI Prices: HC$6.00 MF$1.25

Lawrence Radiation Lab., Univ. of California, Berkeley.
TOTAL SPIN-EXCHANGE CROSS SECTIONS FOR ALKALI ATOMS FROM OPTICAL PUMPING EXPERIMENTS.
Doctoral thesis,
by Wyatt McDonald Gibbs. 12 Mar 65, 202p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear spins, Pumping(Electronics)), (*Pumping(Electronics), Alkali metals).

UCRL-16115 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
A STUDY OF REGGE DYNAMICS IN PION-NUCLEON SCATTERING.
Doctoral thesis,
by John D. Stack. 27 Apr 65, 92p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Pions, Nuclear scattering), (*Nuclear scattering, Dynamics).

WAPD-T-1756 Field 20H, 18K
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
RITZ DIFFERENCE EQUATIONS IN A TRIANGULATION,
by R. B. Kellogg. Jan 65, 15p CONF-650501-5
Contract AT-11-1-GEN-14
Unclassified report

For presentation at the International Meeting, The Application of Computing Methods to Reactor Problems, Argonne, Ill., 17-19 May 1965.

Descriptors: (*Difference equations, Neutron transport theory).

WAPD-TM-477 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
THE PDQ-5 AND PDQ-6 PROGRAMS FOR THE SOLUTION OF THE TWO-DIMENSIONAL NEUTRON DIFFUSION-DEPLETION PROBLEM,
by W. R. Cadwell, P. F. Buerger, and C. J. Pfeifer.
Jan 65, 81p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Neutron transport theory, Programming-(Computers)), (*Programming(Computers), Neutron transport theory).

21. Propulsion and Fuels

N65-16081 Field 21B, 21H
CFSTI Prices: HC$2.00 MF$0.50

Marquardt Corp., Van Nuys, Calif.
FEASIBILITY STUDY OF OXYGEN/HYDROGEN POWDERED METAL IGNITION.
Quarterly progress rept. no. 1 16 Sep-15 Dec 64,
by J. L. Jones. 21 Dec 64, 30p
Rept. no. 25151
NAS8-11250
NASA CR-60478
Unclassified report

Descriptors: (*Ignition, Powder metals), (*Liquid rocket fuels, Ignition).

N65-21432 Field 21C
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Lima, Ohio.
Aerospace Electrical Div.
AN EXPERIMENTAL MODEL OF A 2KW, 2500 VOLT POWER CONVERTER FOR ION THRUSTORS USING SILICON TRANSISTORS IN A PULSE-WIDTH-MODULATED BRIDGE INVERTER.
Summary rept.,
by G. W. Ernsberger. 1 Mar 65, 72p
WAED65-12E
Contract NAS3-5918
NASA CR-54217
Unclassified report

Descriptors: (*Ion engines, Power supplies), (*Inverters, Ion engines).

N65-21465 Field 21E, 14B
CFSTI Prices: HC$5.00 MF$1.00

General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
INSTRUMENTATION DESIGN STUDY FOR TESTING A HYPERSONIC RAMJET ENGINE ON THE X-15 A-2. VOLUME 3. CONCEPTUAL DESIGN OF MEASUREMENT SYSTEMS,
by J. E. Fischer, W. M. Shaffernocker, C. M. Stanforth, and J. F. Williams. 20 Mar 65, 182p
Contract NAS4 715
NASA CR-62148
Unclassified report

Descriptors: (*Ramjet engines, Test equipment), (*Test equipment, Hypersonic planes).

N65-22975 Field 21C, 20H
CFSTI Prices: HC$4.00 MF$1.00

Thompson Ramo Wooldridge, Inc., Cleveland, Ohio.
New Product Research Dept.
INVESTIGATION, TESTING, AND DEVELOPMENT OF AN ELECTRON-BOMBARDMENT ION ENGINE SYSTEM.
Final rept., 3 Mar-14 Dec 64,
by A. C. Eckert, R. J. Coerdt, M. B. Moffett, and M. W. Mueller. 15 Dec 64, 132p TRW-ER-6291
Contract NAS3 5745
NASA CR-54148
Unclassified report

Descriptors: (*Ion engines, Electron bombardment), (*Electron bombardment, Ion engines).

N65-24982 Field 21B, 21H
CFSTI Prices: HC$1.00 MF$0.50

Atlantic Research Corp., Alexandria, Va.
A THEORETICAL MODEL FOR PREDICTING ALUMINUM OXIDE PARTICAL SIZE DISTRIBUTIONS IN ROCKET EXHAUSTS,
by Harvey L. Fein. 1964, 25p
Contract NAS7 100
NASA CR-63104
Unclassified report

Microfilmed from best available copy.

Descriptors: (*Exhaust gases, Rocket motors), (*Particle size, Exhaust gases).

N65-25588 Field 21I, 21H, 18D
CFSTI Prices: HC$3.00 MF$0.75

Giannini Controls Corp., Duarte, Calif.
Control/Nucleonics Div.
LARGE STORAGE TANK MASS DETERMINATION STUDY.

Quarterly rept. phase 1.
9 Apr 65, 62p Rept. no. ER-80212
Contract NAS8 11311
NASA CR-63263

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Propellant tanks, Control systems), Neutron beams, Radiation measurement systems.

N65-28414 Field 21E
CFSTI Prices: HC$4.00 MF$1.00

Research and Advanced Development Div., AVCO Corp., Wilmington, Mass.
RESISTOJET RESEARCH AND DEVELOPMENT - PHASE II.
Quarterly progress rept. no. 3,
by Richard D. John. 10 Jun 65, 130p
Rept. no. AVCO RAD-TR-65-13
Contract NAS3 5908
NASA CR-54330

Unclassified report

See also N65-19265.

Descriptors: (*Jet engines, Thrust).

N65-28136 Field 21E
CFSTI Prices: HC$1.00 MF$0.50

National AdvisoryCommittee for Aeronautics, Cleveland, Ohio. Lewis Flight Propulsion Lab.
COMBUSTOR PERFORMANCE OF A 16-INCH RAM JET USING GASEOUS HYDROGEN AS FUEL AT MACH NUMBER 3.0.
Research memo.,
by Joseph F. Wasserbauer and Fred A. Wilcox.
18 Jan 57, 24p Rept. no. NACA-RM-E56K28a

Unclassified report

Descriptors: (*Ramjet engines, Performance-(Engineering)).

N65-28445 Field 21E, 21D
CFSTI Prices: HC$1.00 MF$0.50

National Advisory Committee for Aeronautics, Cleveland, Ohio. Lewis Flight Propulsion Lab.
THE APPEARANCE OF A BORIC OXIDE EXHAUST CLOUD FROM A TURBOJET ENGINE OPERATING ON TRIMETHYLBORATE FUEL,
by Albert M. Lord and Warner B. Kaufman.
10 Aug 56, 12p CSCL 21E
NASA RM-E56G30

Unclassified report

Descriptors: (*Jet engine fuels, Boron compounds), (*Boron compounds, Jet engine fuels), Exhaust gases.

N65-30187 Field 21H, 14B, 22D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
MEASURED ACOUSTIC PROPAGATION PARAMETERS IN THE MISSISSIPPI TEST OPERATIONS AREA,
by Richard N. Tedrick and Robert C. Polly.
Aug65, 50p NASA-TM-X-1132

Unclassified report

Descriptors: (*Acoustics, Rocket motor noise), (*Rocket motors, Test facilities).

N65-30960 Field 21H
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANALYTICAL INVESTIGATION OF THREE TURBO-PUMP FEED SYSTEMS SUITABLE FOR HIGH-PRESSURE HYDROGEN-OXYGEN ROCKET-ENGINE APPLICATIONS,
by Richard J. Roelke. Aug 65, 30p
NASA TND-2974

Unclassified report

Descriptors: (*Turbopumps, Rocket motors), (*Feed pumps, Rocket motors).

N65-33351 Field 21E, 1B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
NOISE STUDIES OF INLET-GUIDE-VANE-ROTOR INTERACTION OF A SINGLE-STAGE AXIAL FLOW COMPRESSOR,
by John L. Crigler and W. Latham Copeland.
Sep 65, 40p
NASA TND-2962

Unclassified report

Descriptors: (*Axial-flow compressors, Noise), (*Jet engine noise, Reduction).

NYO-3237-1 Field 21E
CFSTI Prices: HC$3.00 MF$0.50

Mechanical Technology Inc., Latham, N. Y.
DESIGN AND DEVELOPMENT OF A GAS-BEARING BRAYTON CYCLE TURBOCOMPRESSOR,
1 Mar 65, 96p MTI-64TR7
Contract AT(30-1)-3237

Unclassified report

Descriptors: (*Brayton cycle, Compressors), (*Compressors, Brayton cycle), (*Gas generator engines, Brayton cycle).

Patent 3,207,584 Field 21I, 7B

VOLUMETRIC DETERMINATION OF PERCHLORATES IN POLYSULFIDE PROPELLANTS.
Patent assigned to Army,
by Bernard J. Alley and Hiram W. H. Dykes.
21 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Perchlorates, Volumetric analysis), (*Solid rocket oxidizers, Volumetric analysis), Solid rocket propellants, Sulfides, Polymers, Titanium, Sulfuric acid, Ammonium compounds, Sulfates, Solid rocket propellant binders, Silver compounds, Nitrates, Titanium compounds, Hydrides, Patents.

The perchlorates are used as an oxidizer utilized in pyrotechnic and propellant compositions. The amount of perchlorate ion present in a sample of perchlorate-containing material is determined by reducing the perchlorate ion with excess titanium hydride in the presence of aqueous sulfuric acid, oxidizing the excess tripositive titanium ion with excess ammonium persulfate and then titrating the chloride ion with a standard aqueous solution of silver nitrate.

Patent 3,208,215 Field 21H

GIMBALED, PARTIALLY SUBMERGED ROCKET NOZZLE.
Patent assigned to NASA,
by Richard L. Brown. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Rocket motor nozzles, Gimbals), (*Rocket motor(Solid propellant), Rocket motor nozzles), Patents, Movable nozzles.

The rocket nozzle is for the rocket motor of a space vehicle. The swivel nozzle is adapted for solid propellant rocket engines. This is done by partially submerging the nozzle entrance within the combustion chamber. The juncture of the nozzle and the casing forming the combustion chamber is therefore removed from the high velocity flow of the exhaust gases which caused the considerable sealing problem along the split line. Also, as the prior use of exhaust flow deflectors and straighteners is eliminated an overall shorter engine length is achieved. With a shorter engine, the length of a solid propellant chamber may be increased.

Patent 3,208,267 Field 21D, 13K

CONTAMINANT MEASUREMENT.
Patent assigned to Navy,
by Paul Schatzberg. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fuel contamination, Measurement), (*Liquids, Contamination), Patents, Jet engine fuels, Solids, Fuel filters, Liquid filters, Determination, Test methods.

The method is for measuring the amount of solid contaminants in an organic liquid. It can be used for determining the filter plugging tendency of a jet fuel. A membrane filter is used. The fuel is passed through the same filter two times. The ratio of the time required to filter the second portion of 100 milliliters of filtered fuel to the time required to filter the first portion of 100 milliliters of filtered fuel is proportional to the amount of solid contaminants in the unfiltered fuel that was passed through the filter between the first and second portions of filtered fuel.

Patent 3,208,383 Field 21E, 16D

RAMJET VENT.
Patent assigned to Navy,
by Roland W. Larson. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Ramjet engines, Diffusers), Exhaust diffusers, Guided missile components, Velocity, Angle of attack, Patents.

The controllable cowl vents are positioned in circumferentially spaced relationship about the diameter of the diffuser of a ramjet engine. The controllable cowl vent arrangement is constructed to permit selective relief of pressure within the engine to thereby compensate for changes in velocity and angle of attack of the missile. (Author)

Patent 3,210,927 Field 21H

ELECTRO-THERMAL ROCKETS HAVING IMPROVED HEAT EXCHANGERS.
Patent assigned to NASA,
by Paul F. Brinich and John R. Jack. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Rocket motors, Heat exchangers), Convergent divergent nozzles, Resistance(Electrical), Heating, Electric insulation, Coils, Patents.

The electrically-powered resistance heated heat exchanger is for an electro-thermal rocket. The heat exchanger utilizes a wire coil which is readily fabricated and easily attached to the engine. The coil is supported by perforated strips of electrical insulating material which also maintain the spacing between the individual coil turns. The insulator strips fit into slots in a heater core to accommodate a limited degree of motion caused by thermal expansion of the heater.

Patent 3,210,928 Field 21E, 21H

FUEL COOLED COMBUSTOR ASSEMBLY.
Patent assigned to Navy,
by Joseph J. Zelinski. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Ramjet engines, Combustion), (*Guided missiles, Combustion), Flame holders, Fuel injectors, Cooling, Patents.

The combustor assembly is for a rocket engine for aircraft and missiles. The combustor assembly includes a three-dimensional system of gutter-type flameholders with contra-stream fuel injectors mounted thereon. All the major parts are internally cooled. The fuel nozzles are integral with the flameholder.

Patent 3,210,935 Field 21H, 16D

JETEVATOR FOR MISSILE CONTROL.
Patent assigned to Navy,
by Lyman C. Fisher. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Jetavators, Guided missiles), (*Guided missiles, Flight control systems), Exhaust nozzles, Rocket motor nozzles, Exhaust gases, Patents.

The jetevator deflects the exhaust of a reaction motor. It closely fits the sphere-shaped portion of the nozzle and forms a ball and socket joint. The device moves on a pivot and is operated by two control rods. The jetevator has two sets of apertures. The structure does not permit the formation of appreciable exhaust gas deposits thereon.

Patent 3,210,936 Field 21H

JETEVATOR FOR MISSILE CONTROL.
Patent assigned to Navy,
by Lyman C. Fisher. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Jetavators, Guided missiles), (*Guided missiles, Control systems), Thrust vector control systems, Rocket motors, Exhaust gases, Deflection, Patents.

The jetevator deflects the exhaust of a rocket motor. The 'socket' type jetevator is leakproof and not subject to binding. The structure prevents the build-up of solid residues on the jetevator.

Patent 3,210,937 Field 21H

THRUST CONTROL APPARATUS.
Patent assigned to Navy,
by Henry A. Perry, Jr. 12 Oct 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Thrust vector control systems, Rockets), Movable nozzles, Plug nozzles, Patents.

The apparatus is used to vary, reverse, or neutralize the magnitude and direction of the thrust vector of a rocket in powered flight. The nozzle is movable and may be selectively tilted. A pintle supports a plug at the opening of the base of the nozzle. The positioning of the nozzle with respect to the plug controls the thrust vector.

TID-21212 Field 21F
CFSTI Prices: HC$3.00 MF$0.75

Babcock and Wilcox Co., Alliance, Ohio. Research Center.
THERMAL INSULATION TEST. CNSG REACTOR STUDIES.
Research rept. no. 545,
by T. E. Hollowell. 20 Jan 64, 82p
Contract AT(30-1)-3198
Unclassified report

Descriptors: (*Thermal insulation, Marine nuclear propulsion), (*Marine nuclear propulsion, Thermal insulation).

22. Space Technology

N65-15822 Field 22A, 1B
CFSTI Prices: HC$4.00 MF$1.00

Electro-Optical Systems, Inc., Pasadena, Calif.
EVALUATION OF CRITICAL FACTORS RELATED TO A FLIGHT EXPERIMENT FOR REFLECTIVE SURFACE SAMPLES.
Final rept. for 21 Mar-20 Jul 64,
by P. A. Button. 31 Jul 64, 122p
Rept. no. EOS-5101
Contract NAS1 3850 Unclassified report
NASA CR-60400
Microfilmed from best available copy.

Descriptors: (*Reflectometers, Astronautics), (*Astronautics, Instrumentation).

N65-16811 Field 22B, 20E, 17B
CFSTI Prices: HC$4.00 MF$0.75

Kollsman Instrument Corp., Elmhurst, N. Y. Corporate Technology Center.
STUDY OF LASER POINTING PROBLEMS.
Bimonthly technical rept. 1 Oct-30 Nov 64,
by A. Wallace. 15 Dec 64, 108p KIC-RD-000162-2
Contract NASW 929
NASA CR-60699
Unclassified report

Descriptors: (*Lasers, Space communication systems), (*Space communication systems, Lasers).

N65-17522 Field 22D, 11D
CFSTI Prices: HC$6.00 MF$1.25

North American Aviation, Inc., Los Angeles, Calif.
DEVELOPMENT OF HIGH STRENGTH LOW DENSITY COMPOSITE MATERIALS FOR SATURN APPLICATIONS.
Annual summary rept. for 1 Oct 63-31 Dec 64,
by J. W. Huffman. 29 Jan 65, 216p NA-63-1358-13
Contract NAS8 11108
NASA CR-60827
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Composite materials), (*Composite materials, Propellant tanks).

N65-18949 Field 22D, 9F
CFSTI Prices: HC$1.00 MF$0.50

Rand Corp., Santa Monica, Calif.
A PROPOSED METHOD FOR ON-BOARD MONITORING OF DISCRETE SIGNALS,
by L. D. Amdahl and L. T. Mast. Feb 65, 23p
Memo. RM-4455-NASA
Contract NASr2108
NASA CR-57171
Unclassified report

Descriptors: (*Spacecraft, Checkout equipment), (*Telemeter systems, Spacecraft).

N65-19858 Field 22A
CFSTI Prices: HC$4.00 MF$1.00

Westinghouse Defense and Space Center, Baltimore, Md. Aerospace Div.
ADVANCED SPACEBORNE DETECTION, TRACKING, AND NAVIGATION SYSTEMS STUDY AND ANALYSIS. VOLUME I. SUMMARY.
Compilation rept.
Jul 64, 143p WDSC-1750A
Contract NAS8 11205
NASA CR-57438
Unclassified report

Descriptors: (*Astronautics, Reports).

N65-21458 Field 22A
CFSTI Prices: HC$7.00 MF$2.25

Lockheed Missiles and Space Co., Sunnyvale, Calif.
MARINER MARS 1969 ORBITER STUDY.
Final rept.
4 Oct 64, 460p M-29-64-1
Contracts NAS7-100; JPL950877
NASA CR-62193
Unclassified report

Descriptors: (*Mars probes, Feasibility studies).

N65-21468 Field 22D, 21I
CFSTI Prices: HC$3.00 MF$0.50

Chrysler Corp., Huntsville, Ala. Space Div.

SA-9 VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION. VOLUME III: LIQUID HYDROGEN SYSTEM.
May 64, 61p HEC-D042, Vol. III
Contract NAS8 4016
NASA CR-6217

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Propulsion systems).

N65-22556 Field 22B, 11H
CFSTI Prices: HC$3.00 MF$0.75

IIT Research Inst., Chicago, Ill. Mechanical Engineering Div.
FEASIBILITY STUDY OF TECHNIQUES TO PROTECT MECHANISMS OPERATING IN SPACE FROM MALUFUNCTION. PART I: SURVEY AND ANALYSIS.
Final rept.,
by W. E. Jamison. 30 Nov 64, 88p K-6055, Pt. 1
Contract NAS8 11014
NASA CR-62281

Unclassified report

Descriptors: (*Spacecraft, Lubricants), (*Lubricants, Feasibility studies).

N65-22557 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

IIT Research Inst., Chicago, Ill. Mechanical Engineering Div.
FEASIBILITY STUDY OF TECHNIQUES TO PROTECT MECHANISMS OPERATING IN SPACE FROM MALFUNCTION. PART II: EXPERIMENTAL RESULTS AND RECOMMENDATIONS.
Final rept., 8 Jun 63-27 Jun 64,
by W. E. Jamison. Jan 65, 50p C-6055, Pt. II
Contract NAS8 11014
NASA CR-62282

Unclassified report

Descriptors: (*Spacecraft, Friction), (*Friction, Spacecraft).

N65-22848 Field 22B
CFSTI Prices: HC$7.00 MF$2.00

SPS Labs Standard Pressed Steel Co., Jenkintown, Pa.
EVALUATION OF FASTENERS AND FASTENER MATERIALS FOR SPACE VEHICLES.
Annual rept. Nov 63-Nov 64,
by J. J. Glackin and E. F. Gowen, Jr. 31 Dec 64, 401p
Contract NAS8 11125
NASA CR-62458

Unclassified report

Descriptors: (*Spacecraft, Fastenings), (*Fastenings, Spacecraft).

N65-22972 Field 22A, 17B
CFSTI Prices: HC$2.00 MF$0.50

Northrop Space Labs., Huntsville, Ala.
APOLLO LOGISTICS SUPPORT SYSTEMS MOLAB STUDIES. GROUND WAVE PROPAGATION ON THE LUNAR SURFACE FOR A LUNAR MOBILE LABORATORY,
by J. D. Hughlett, Jr. Jun 64, 44p
Contract NAS8 11096
NASA CR-61045

Unclassified report

Descriptors: (*Space stations, Lunar craft), (*Space communication systems, Propagation).

N65-22973 Field 22A, 21F
CFSTI Prices: HC$2.00 MF$0.50

Northrop Space Labs., Huntsville, Ala.
APOLLO LOGISTICS SUPPORT SYSTEMS MOLAB STUDIES. RADIOISOTOPE POWER SYSTEMS FOR A LUNAR VEHICLE,
by W. L. Breazeale. Mar 65, 44p
Contract NAS8 11096
NASA CR-61046

Unclassified report

Descriptors: (*Space stations, Lunar craft), (*Nuclear propulsion, Lunar craft).

N65-24307 Field 22B, 3B
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
INSTRUMENTATION TO MEASURE MARS' ATMOSPHERIC COMPOSITION, USING A SOFT-LANDED PROBE,
by R. O. Woods and J. W. Ranftl. Apr 65, 26p
Memo. no. RM-4451-NASA
Contract NASr21 09
NASA CR-62870

Unclassified report

Microfilmed from best available copy.

Descriptors: (*Mars probes, Instrumentation), (*Planetary atmospheres, Mars probes).

N65-24895 Field 22B, 3B
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
USE OF RADIATION GAUGING METHODS TO MEASURE ATMOSPHERIC DENSITY DURING MARTIAN ENTRY,
by J. W. Ranftl. Apr 65, 81p RM-4434-NASA
Contract NASr 21
NASA CR-62971

Unclassified report

Descriptors: (*Mars probes, X-ray spectroscopy), (*X-ray spectroscopy, Mars probes).

N65-24896 Field 22B, 22D
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Philadelphia Pa. Missile and Space Div.
VOYAGER SPACECRAFT SYSTEM STUDY. PHASE I: TITAN IIIC LAUNCH VEHICLE.
Final report Vol. I: Summary.
7 Aug 64, 81p 64SD933
Contract NAS7 100
NASA CR-62958; JPL 950847

Unclassified report

Descriptors: (*Spacecraft, Launch vehicles(Aerospace)), (*Launch vehicles(Aerospace), Spacecraft).

N65-24979 Field 22B
CFSTI Prices: HC$3.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SURVEYOR PROJECT STATUS REPORT AS OF 14 MAY 1965,
by L. S. Frankenstein. 20 May 65, 54p
Contract NAS7 100
NASA CR-63124

Unclassified report

Descriptors: (*Lunar surface vehicles, Flight testing).

N65-24985 Field 22B
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
LOW SUBSONIC DYNAMIC-STABILITY INVESTIGATION OF SEVERAL PLANETARY-ENTRY CONFIGURATIONS IN A VERTICAL WIND TUNNEL, PART I,
by Jack E. Marte and Robert W. Weaver.
1 May 65, 18p JPL-TR-32-743
Contract NAS7 100
NASA CR-63117

Unclassified report

Descriptors: (*Mars probes, Model tests).

N65-26083 Field 22B, 18H
CFSTI Prices: HC$5.00 MF$1.25

Boeing Co., Seattle, Wash. Aero-Space Div.
SPACE RADIATION TESTS ON REFLECTING SURFACES.
Final rept.
Jun 65, 183p Rept. no. D2-36359-1
Contracts NAS7 100, JPL950998 Unclassified report
NASA CR-63371
Microfilmed from best available copy.

Descriptors: (*Reflectors, Radiation damage), (*Space environmental conditions, Charged particles).

N65-26400 Field 22B, 9A, 18D
CFSTI Prices: HC$4.00 MF$1.00

EON Corp., Brooklyn, N. Y.
STERILIZABLE GEIGER-MUELLER TUBES FOR SPACE APPLICATIONS.
Final rept.,
by G. R. Weinberg. 22 Mar 65, 145p
Contracts NAS7 100, JPL CPFF950681
NASA CR-63394

Unclassified report

Descriptors: (*Geiger counters, Electron tubes), (*Spacecraft, Electronic equipment).

N65-26404 Field 22C
CFSTI Prices: HC$3.00 MF$0.75

Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
CATALOG OF SATELLITE OBSERVATIONS, NUMBER C-41,
by Beatrice Miller. 5 May 65, 71p
Rept. no. SAO178
Grant NsG 87-60
NASA CR-63426 Unclassified report

Descriptors: (*Satellites(Artificial), Position finding), (*Astronautics, Space surveillance systems).

N65-26407 Field 22B
CFSTI Prices: HC$3.00 MF$0.75

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
MAXIMUM MODEL-SIZE DETERMINATION AND EFFECTS OF THE STING DIAMETER ON AN ENTRY SHAPE AND SPHERE FOR LOW SUPERSONIC MACH-NUMBER TESTING,
by J. G. Herrera. 30 Oct 64, 57p JPL-TM-33-191
Contract NAS7 100
NASA CR-63429

Unclassified report

Descriptors: (*Reentry vehicles, Supersonic characteristics).

N65-26416 Field 22B
CFSTI Prices: HC$7.00 MF$1.75

Jet Propulsion Lab., Calif. Inst. of Tech. Pasadena.
SPACE PROGRAMS SUMMARY NO. 37-32, VOLUME IV. FOR THE PERIOD 1 FEBRUARY-31 MARCH 1965. SUPPORTING RESEARCH AND ADVANCED DEVELOPMENT.
30 Apr 65, 317p
Contract NAS7 100
NASA CR-63396

Unclassified report

Descriptors: (*Spacecraft, Scientific research).

N65-27944 Field 22B, 9E
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Washington, D. C. Performance Analysis and Control Configuration Management.
ELECTRICAL POWER MANAGEMENT STANDARD.
Rept. on Apollo program.
15 Jun 65, 31p Rept. no. CMO-19-000-1
NASA SP-6005

Unclassified report

Descriptors: (*Spacecraft, Power equipment), (*Power equipment, Standards).

N65-28000 Field 22A, 22C
CFSTI Prices: HC$4.00 MF$0.75

Brown Engineering Co., Inc., Huntsville, Ala.
PARAMETRIC STUDY OF LUNAR LANDING TECHNIQUES USING A PREDETERMINED THRUST ORIENTATION,
by Sam H. Harlin, Jr. Jun 65, 100p
Contract NAS8 20073
NASA CR-61075

Unclassified report

Descriptors: (*Soft landings, Lunar probes), (*Lunar probes, Soft landings)

N65-28249 Field 22A, 5I
CFSTI Prices: HC$2.00 MF$0.50

Michigan State Univ., East Lansing.
SUMMARY REPORT ON THE NASA UNIVERSITY PROGRAM REVIEW CONFERENCE, KANSAS CITY, MISSOURI, MARCH 1-3, 1965,
byDonald J. Montgomery. 1965, 37p
NASA SP-81

Unclassified report

Descriptors: (*Astronautics, Universities), (*Universities, Astronautics).

N65-29174 Field 22C, 20K
CFSTI Prices: HC$4.00 MF$0.75

Northrop Corp., Newbury Park, Calif.
DEVELOPMENT OF A RADIO-FREQUENCY TRANSPARENT ENERGY-ABSORBING STRUCTURAL ELEMENT,
by Ronald H. Smith. Jul 65, 91p
Contract NAS1 3906
NASA CR-253

Unclassified report

Descriptors: (*Spacecraft, Vibration isolators), (*Vibration isolators, Structures).

N65-29296 Field 22B, 4A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
VISUAL PRESENTATION OF THE MOTION AND ORIENTATION OF AN OBITING SPACECRAFT (OGO),
by Michael Mahoney and John Quann. Jul 65, 13p
NASA-TN-D-2918
Unclassified report

Descriptors: (*Scientific satellites, Geophysics), (*Geophysics, Scientific satellites).

N65-29962 Field 22D, 1A
CFSTI Prices: HC$2.00 MF$0.50

National Aeroantuics and Space Administration, Langley Station, Va. Langley Research Center.
A TRANSONIC INVESTIGATION OF BASE PRESSURES ASSOCIATED WITH SHALLOW THREE-DIMENSIONAL REARWARD-FACING STEPS,
by Thomas C. Kelly. Aug 65, 47p NASA-TN-D-2927
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Design), (*Transonic characteristics, Base flow).

N65-32877 Field 22A, 20M, 21E
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
BASE PRESSURES AND CONVECTIVE HEAT-TRANSFER COEFFICIENTS FOR CLUSTERED SONIC NOZZLES WITH EMPHASIS ON CHOKED EXHAUST BACKFLOW,
by John P. Weidner and James M. Cubbage.
Sep 65, 47p Unclassified report
NASA TND-2929

Descriptors: (*Launch vehicles(Aerospace), Exhaust nozzles), (*Exhaust nozzles, Heat transfer).

Patent 3,208,707 Field 22B

PIVOTAL SHOCK ABSORBING PAD ASSEMBLY.
Patent assigned to NASA,
by Josef F. Blumrich. 28 Sep 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Landing gear, Aerospace craft), Shock resistance, Structural parts, Convex bodies, Joints, Coatings, Friction, Patents.

The landing gear system is for an aerospace vehicle. The landing gear extends or reaches out beyond the diameter of the vehicle stage itself to such an extent as to insure the stability of the vehicle. The landing gear system is of the extended arm type and each of the four arms carries a landing pad. Each pad is designed to maintain a predetermined frictional force as it slides over different types of surfaces.

PB-168 466 Field 22A, 22C, 3B, 3C
CFSTI Prices: HC$3.00 MF$0.75

Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
INDEX TO SAO SPECIAL REPORTS NOS. 1 THROUGH 150.
Special rept.
30 Jun 65, 69p Unclassified report

(This Index supersedes the Index of Special Reports 1-100, published 1 Nov 62).

Descriptors: (*Astronautics, Bibliographies), (*Satellites(Artificial), Astronautics), (*Celestial mechanics, Satellites(Artificial)), (*Space environmental conditions, Bibliographies), Orbital trajectories, Spacecraft, Tracking, Atmospheric sounding, Astrophysics, Space surveillance systems, Astronomical observations.

This index covers the materials published in the Smithsonian Astrophysical Observatory Special Reports Numbers 1 through 150, issued between October 14, 1957, and April 22, 1964. It supersedes the Index of Special Reports 1 through 100, published November 1, 1962. The listing includes four sections: (1) list of individual reports by number, date, author(s), and title; (2) names of authors of signed materials; (3) titles of papers; and (4) significant references to individual satellites.

PB-168 467 Field 22C, 22A, 22B
CFSTI Prices: HC$6.00 MF$1.50

Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
CATALOG OF PRECISELY REDUCED SIMULTANEOUS OBSERVATIONS, NO. S-1,
by Richard Wells. 14 Sep 65, 276p
Special rept. SAO-SR-183
Unclassified report

Descriptors: (*Satellites(Artificial), Position finding), (*Astronautics, Catalogs), Orbital trajectories, Optical tracking, Photographic techniques, Space surveillance systems.

This catalog is the first SAO (Smithsonian Astrophysical Observatory) Special Report listing the positions of artificial satellites photographed simultaneously by Baker-Nunn cameras at two or more stations, and measured by the SAO Photoreduction Division. The films were taken at the SAO Astrophysical Observing Stations and cooperating Air Force Baker-Nunn Camera Stations. The catalog includes all simultaneous observations precisely reduced that have been checked and found to be without significant errors.

SC-DR-64-578 Field 22B, 18N
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DEVELOPMENT AND TESTING OF A RECOVERY SYSTEM FOR THE SNAP-10A RE-ENTRY VEHICLE,
by M. I. Kane, H. E. Widdows and H. Lucero.
Apr 65, 30p
Contract AT(29-1)-789 Unclassified report

Descriptors: (*Reentry vehicles, Nuclear power plants), (*Recovery, Reentry vehicles), Auxilary power plants.

TID-21723 Field 22C
CFSTI Prices: HC$2.00 MF$0.50

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
DISPERSAL OF REACTOR CORE MATERIALS BY REENTRY PROCESSES.
Quarterly rept. for 1 Nov 64-31 Jan 65,
by J. L. Beal, W. R. Brown, and F. A. Vassallo.
Jan 65, 48p CAL-114-020-1; SC-DC-1273
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Reentry vehicles, Ablation), (*Ablation, Oxidation), Zirconium, Zirconium compounds, Hydrides.

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